



A SAS® and Public Policy Analytics LLC Solution to Design and Implement Decision Support Tools and Predictive Analytics in Human Services

Response to Request for Proposal

Presented to: Allegheny County Department of Human Services

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**THE
POWER
TO KNOW®**

Contact Info

Daniel Shults
Account Executive
(919) 531-2713
Daniel.Shults@sas.com

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EXECUTIVE SUMMARY

SAS Institute, Inc., and its partner, Public Policy Analytics (PPA), welcome the opportunity to assist the Allegheny Department of Human Services (DHS) to improve decision making and service delivery. We appreciate the candor of DHS in describing its own evolving use of analytics. We share the County's concern that the advanced technologies that have been regularly deployed in other areas of government and the research community have yet to become common in social service agencies. Too often, the tools available to DHS analysts seeking a scientific approach to answering social service policy questions are the same tools that have been available for decades.

SAS and PPA have been at the forefront of the movement to bring modern analytic tools to social service agencies. In our proposal, we describe numerous successful projects we have implemented at the local and state level. Led by Dr. Manuel Moreno and Dr. Halil Toros, PPA will deploy SAS data mining and visualization software in a secure SAS-hosted environment. Working directly with DHS staff, PPA will build the necessary data structures and models to answer RFP questions focusing on outcomes for at-risk children in the foster care program. The design of the predictive analytics platform will have the flexibility and scalability to eventually support evidence-based decision making in all areas of work by DHS staff. During the project, DHS' own staff will have access to these analytics and visualization tools and learn how to take advantage of these technologies working with PPA using Allegheny County's own data.

PPA brings significant experience implementing decision support tools and applying advanced analytics to inform program and policy decisions in human service agencies to this project. This expertise, augmented by SAS and its industry-leading analytics solutions and software, will help ensure that viable decision support tools are delivered to DHS. Dr. Dennis Culhane, Professor of Social Policy at the University of Pennsylvania and Dr. Emily Putnam-Hornstein, Assistant Professor, School of Social Work at the University of Southern California, will also provide a consulting role as part of the PPA team.

As part of this effort, SAS and PPA will work to ensure that the output of this research – models, scored data, and other tools – can be readily integrated into the County's current case management system. Instead of trying to replace software and systems already in place or build a new, duplicative system, we will seek to augment and improve those systems already in place with data-based information to improve the work currently being done. As we will be working at the direction of DHS, this project can be publicly shared and the lessons learned here can be communicated to a much larger audience.

In our proposal, we describe the technical and practical aspects of implementing this solution for a 12-month project. We welcome the opportunity to discuss further how we can work together and would gladly provide a demonstration of the predictive analytic technologies we will use and make available to DHS staff to support data-informed decisions for human services.

NARRATIVE

1) Describe your organization(s)' history and experience conducting research, translating research into practice, developing/validating tools built on research, developing and implementing predictive models.

For this project, SAS will be working with our partner, Public Policy Analytics, LLC. We feel that this is the ideal team to assist the DHS in advancing its decisioning processes. SAS brings its leading analytics and reporting solutions hosted in a secure SAS environment. PPA brings more than five decades of experience using analytics to assist social service agencies in leveraging data to answer mission-critical public policy questions. Below is a brief overview of SAS and a detailed description of the history and experience of PPA.

SAS

Founded in 1976, SAS serves more than 70,000 government, university, and business sites in 140 countries. SAS solutions are used extensively by all 50 state governments, all 15 federal departments and approximately eighty-five percent (85%) of federal sub-agencies and quasi-governmental affiliates. Ninety percent (90%) of the overall Fortune 500 are SAS customers.

Headquartered in Cary, North Carolina, SAS is the largest privately held software company in the world with 2013 revenue of \$3.02 billion. SAS has been in the business for 38 years and our longevity is a testament to our superior software and customer service. Our mission is to deliver superior software and services that give people the power to make the right decisions.

As the leader in analytics software, SAS helps organizations understand how to translate data into answers, providing the software, services, and IT infrastructure necessary to implement an end-to-end solution for decisioning. For over three decades, SAS has delivered the latest technology to its government customers, taking their operations to new levels. Our U.S. state and local government practice helps state government agencies meet their missions and goals faster and more accurately than ever before.

PUBLIC POLICY ANALYTICS, LLC (PPA)

Public Policy Analytics LLC was founded in 2012 by Dr. Manuel Moreno and Dr. Halil Toros to provide government agencies with technical services to build capacity using administrative data and predictive analytic for making data-based policy and program decisions that translate into effective and efficient policies. PPA was built based on the experience and practice of Drs. Toros and Moreno conducting actionable research for Los Angeles County, developing tools built on research and deploying predictive models to evaluate and improve the public programs and services provided to vulnerable populations for almost 30 years. Below is a description of some of the kinds of projects our team has implemented, turning raw data into actionable intelligence to improve social services.

Between 1999 and 2006, PPA staff conducted several evaluations of the public assistance programs implemented by the Department of Public Social Services as part of the implementation of

CalWORKs, California's version of TANF. In response to the Los Angeles County Commission for Public Social Services' concern with a high rate of sanctions among CalWORKs participants, PPA staff undertook two major studies using predictive models and qualitative methods of research. Since the implementation of welfare reform in the 1990s, the rate of sanctions had been increasing on a virtually continuous basis. The sanctions study focused on clients who had been sanctioned for more than six months or who had experienced multiple sanctions. A series of regression models were used to identify predictors of sanctions and to understand the dynamics of sanctions in the program. Based on the study findings and recommendations the Department of Public Social Services undertook a number of programmatic changes that resulted in a decline on the rate of sanctions in the caseload. Insights from the statistical analysis of those data had a direct impact on policy decisions and improved the delivery of social services for qualified recipients.

In 2000, PPA staff conducted empirical research to understand the transportation barriers preventing participants in the County's welfare-to-work from transitioning to self-sufficiency. In that study, PPA staff identified a series transportation deficiencies related to neighborhood characteristics, the method of travel selected, the types of family-related trips, and the transportation needs generated by the requirements of the program. The study identified the major transportation-related gaps and unmet needs, and made a series of recommendations to implement programmatic changes and policies to remove transportation barriers. By analyzing the data and considering the results, policymakers were able to change policies to allow participants to overcome transportation obstacles to get the appropriate services they needed.

In 2006, the Department of Public Social Services implemented the General Relief Housing Subsidy and Case Management Pilot Project which provided a housing subsidy of up to \$300 per participant per month in rental subsidies and provided a one-time move-in assistance. PPA staff conducted an evaluation of the pilot project using predictive models. This was a true experimental design with an experimental group and a control group that allowed PPA staff to determine whether providing homeless indigent adults with subsidized housing and case management would yield service cost savings subsequent to housing placement. Additionally, PPA staff examined the effects that participation in the pilot had on outcomes in the areas of employment, retention of housing, and qualification for Supplemental Security Income (SSI) benefits.

Findings from that study were translated into practice by developing a series of program and policy recommendations tested first on the pilot population and then implemented on a countywide basis. The predictive models yielded a number of relevant findings and promising best practices. For example, based on the findings related to helping participants to qualify for SSI, PPA staff began to formulate the development and implementation of predictive tools for use by caseworkers to determine the General Relief housing subsidy participants who would be most likely to qualify for SSI, and therefore implement a casework support system to target these participants.

After conducting several such studies, PPA staff began to envision a more extensible platform, a more general enterprise-wide approach to data and analytics that would serve as the foundation for other projects in the future. In previous efforts, PPA staff had gathered data for a specific set of research questions. While that approach, typical in social services, was successful in providing

insights into one or more policy questions, PPA staff needed a platform that could allow us to answer a much wider set of policy questions on an ongoing basis – even questions that had not yet been asked.

The work of PPA staff in Los Angeles County generating evidence to guide and inform program and policy decisions led us to develop and implement validating tools based on research. In 2007, PPA staff piloted the concept of integrating administrative records from the Department of Community and Senior Services, Health Services, Mental Health, Public Health Children and Family Services, Probation, and the Sheriff Department. The goal was to create a central repository of data for use in policy research and evaluation and to assist case workers and administrators of public programs in providing more efficient, identifying redundant services, and identifying the characteristics of factors correlated with certain patterns of service utilization and to assess risk to families and children. This project was originally known as the Adult Linkages Project or “ALP.”

PPA staff were particularly interested in using ALP to deploy predictive models to assess the likelihood of risks and to identify outcomes in program participation. The general notion was to use the ALP tool as an evidence-based system for use in applied research as the basis for targeting special interventions with certain groups of participants in public programs and to inform the practices of policy makers, administrators and caseworkers. Furthermore, PPA staff were interested in validating these integration technology tools based on practical and program related research.

Upon the completion of the ALP pilot, PPA staff validated the system by conducting a study to determine the costs and patterns of service utilization among General Relief Recipients. The study aimed at arriving at an empirical understanding of how General Relief recipients interact with various county agencies providing services to indigent adults. The study examined the characteristics of General Relief participants, analyzed the cost and extent of service utilization by clients across multiple county agencies, and analyzed the of certain sub-populations of clients whose multi-agency service use costs were substantially higher than the average for General Relief participants as a whole.

The successful implementation of the ALP pilot led to the official expansion and implementation of ALP as a permanent integrated data system called Enterprise Linkages Project (“ELP”). This project continues to this day, serving as a platform to answer a wide variety of important public policy questions, the answers to which are used to improve the efficiency and effectiveness of social services to the residents of LA County. A detailed description of the ELP is presented in Appendix 1.

2) Describe relevant experience in working with human services practitioners (including government analysts, clinicians, social workers, leaders).

Dr. Manuel Moreno and Dr. Halil Toros have been working with human services practitioners in Los Angeles County since the late 1990s. While Dr. Moreno’s Ph.D. is in sociology and applied research and Dr. Toros’ Ph.D. is in economics and public policy, PPA understands the responsibilities and roles played by a large number of different professionals who must work together to deliver social services: psychologists, court officials, social workers, counselors, attorneys, law enforcement

officers, managers, and others ,including nonprofits and other community agencies that impact the quality of care provided by public agencies.

PPA worked closely with human services analysts, social workers, stakeholders and leaders to design a comprehensive evaluation plan and to evaluate all the TANF programs in Los Angeles. Between 1999 and 2006, PPA staff conducted several outcome evaluations of all the CalWORKs programs for families and children using both predictive models and qualitative analysis. PPA staff also participated in several workgroups with human services practitioners, analysts and stakeholders to prepare a series of action plans to ensure that policy and program recommendations were implemented by the Department of Social Services to revamp and improve the programs.

In 2007, PPA staff worked closely with clinicians, social workers and government leaders in Los Angeles County charged by elected official with the implementation of Project 50, a supportive services program to move chronically homeless into supportive housing. Our role was to conduct a quantitative evaluation and a cost benefit of the program to assess the offsets of the program.

Between 2007 and 2010, PPA staff worked with human services practitioners, analysts, and social workers to design and implement an integrated data system for use in delivering better services to indigent adults participating in the County's general relief system. PPA staff worked closely with social workers to ensure that the user interface would provide the statistical and outcome information to caseworkers required to provide targeted services to several subpopulations of general relief participants, such as those heavily using public services.

In 2009, PPA staff also started to work with leaders and human services practitioners in Los Angeles County to make a contribution towards taking a proactive approach on the problem of child abuse and maltreatment in the County. PPA staff introduced the County to the idea of using predictive models and case level data to predict the likelihood of child abuse and maltreatment. Based on this work the Department of Children of Family Services (DCFS) is currently working with SAS to conduct a pilot project to assess the feasibility of using predictive models in determining the likelihood of child abuse and maltreatment in active DCFS cases.

In addition, PPA staff also worked closely in a lead role with human services managers and welfare fraud investigators to implement a system based on predictive models and data mining technology to detect and prevent fraud in the County's public assistance programs. Finally, PPA staff took a primary role in Los Angeles County to brief and communicate to elected officials, policy makers and human services managers the results of the outcome evaluation work PPA staff conducted in for Los Angeles County.

3) Describe any collaborative projects on which your organization worked, naming partner organizations.

As an analytics company, SAS has provided the technologies that allow government agencies, public-private partnerships, and other collaborative communities to work together. As an example of the company's support for such engagements, please see our work with Project Data Sphere

(<https://www.projectdatasphere.org/projectdatasphere/html/home.html>). Started by the CEO Roundtable, Project Data Sphere is a collaborative workspace where pharmaceutical companies have come together to share clinical trial data. SAS hosts and provides the SAS tools necessary for this community of researchers to analyze open source data to advance the fight against cancer. While the platform we are proposing for the County is secure and will be restricted only to only DHS analysts, we could also assist in implementing a far more open environment such as the data transparency projects we have implemented and public portal reporting systems we host.

In terms of consulting, Drs. Toros and Moreno have a substantial history of working on collaborative projects with partner organizations, including with researchers at the University of Pennsylvania School of Social Policy and Practice and with the University of the Sciences in Philadelphia, Department of Health Policy and Public Health, to study the adult outcomes of youth who “aged-out” of the child welfare system in Los Angeles County. The study, titled *Young Adult Outcomes of Youth Exiting Dependent or Delinquent Care in Los Angeles County*, was released in 2012 and focused on two cohorts of youth who aged out of the County’s supervised foster care system and the juvenile probation system and utilized ELP as a data source. In addition, one of the innovations of this research was to examine specifically a group of youth who exited an out-of-home welfare placement between the ages of 16 and 21 and who “crossed-over” into the juvenile probation system. Using predictive analytics and regression models the study advances several key findings with programmatic and public policy implications. For example, one of the findings indicates that membership in the crossover group is a strong and consistent predictor of less desirable outcomes. One of the critical study findings was that, among child welfare involved youth, older age of entry into care is consistently associated with less desirable outcomes and that a history of treatment for a serious mental illness is associated with an increased likelihood of a jail stay, receipt of public assistance and lower earnings.

During our tenure with Los Angeles County, PPA staff actively participated and collaborated with the University of Pennsylvania as members of the Actionable Intelligence for Social Policy (AISP) group, an initiative funded by the MacArthur Foundation through a grant to University of Pennsylvania Professors Dennis Culhane, School of Social Policy and Practice, and John Fantuzzo, Graduate School of Education. The organizational objective of AISP is to improve the quality of education, health and human service agencies’ policies and practices through the use of integrated systems. Through participation in this organization, PPA staff were engaged to work collaboratively with the University of South Florida representing Hillsborough County in Tampa, with University of Pennsylvania, with the University of the Sciences in Philadelphia, and with the US Department of Veterans affairs on a project focusing on the outcomes of Veterans and Non-Veterans in the cities. The study focuses on cohorts of individuals released from jail or prison in Philadelphia, Tampa and Los Angeles to examine a series of post-release outcomes to evaluate whether veterans who access VA services have better outcomes in areas such as re-incarceration, homelessness, and engagement.

Other collaborative projects include work with the Economic Roundtable of Los Angeles on a series of projects focusing on homelessness. The Economic Roundtable is a non-profit corporation established in 1991 to conduct economic, social and environmental research that contributes to the sustainability of individuals and communities. In 2009, PPA staff worked on a collaborative project

with the Economic Roundtable to study the question of whether the public costs for people in supportive housing compared to similar people that are homeless. *When We Sleep: Costs when Homeless and Housed in Los Angeles* was one study that used the Enterprise Linkages Project as a source of data. In that study, PPA used logistic regression to estimate the typical costs for individuals housed in supportive housing is \$605 a month, while the typical cost for homeless persons not housed in supportive housing is \$2,897 a month. Understanding the difference in these costs, based on an accurate summary of complex data, was critical in the decision process surrounding that program.

That initial study was followed with a subsequent study to develop a triage tool for identifying homeless adults in crisis. The Crisis Indicator study released in 2011 presents the development of a triage tool for identifying patients who have continuing crises in their lives, which create very high costs when accessing public services. The tool was developed for use in jails, hospitals and clinics where there are high levels of need and high public costs. The use of this tool has led to the discovery of the high public cost in service utilization for people in the 10th cost decile and a policy interest in identifying these individuals and giving them a high priority for access to permanent supportive housing. This research led to a further collaboration to work on the development of a triage tool specifically designed for use in hospitals or clinics to identify the ten percent of homeless patients with the highest public costs when accessing medical and health services. The development and implementation of this triage is described in a 2012 publication titled *Hospital to Home: Triage Tool II for Identifying Homeless Hospital Patients in Crisis*.

Consistent with PPA's approach to all of its work, the findings from PPA's work with the University of Pennsylvania and the Economic Roundtable of Los Angeles resulted in published studies of those findings, making the insights from those projects available to all researchers, policy makers, and practitioners who could take advantage of those lessons learned.

4) Describe the way your organization or collaboration would manage the process of working with DHS to design and implement decision support tools and predictive analytics.

Using the software and infrastructure provided by the SAS-hosted environment, Dr. Toros and Dr. Moreno will lead the project. All work will be conducted in an open, collaborative environment. At the start of the project, appropriate DHS staff will be provided access to the hosted software environment, managed by a SAS Project manager. At the same time, we will engage in a set of discovery sessions with DHS staff to ensure that the SAS/PPA team understands the available data (format, structure, linkages or lack thereof, quality issues, and so on), the processes by which case workers access and use case intelligence in their current decisioning process (current alerting/flagging, caseload management, and so on), and how the team can best support DHS in using the available data to answer questions about outcomes for at-risk children.

Relevant, appropriate data will be securely transferred to the SAS-hosted environment. We note that SAS hosts many projects like this and can provide additional information on HIPAA, FERPA, and any other security concerns. Once the data are in the secure environment, the PPA team will work in an open fashion with DHS staff, showing the DHS team every data transformation, every model, and

every visualization during the deployment process. Working in a completely transparent fashion, the PPA team will schedule weekly project meetings to review work underway, ensuring that the deliverables of the Project Timeline are met and that DHS staff have full insight into all work completed.

This is a model that has served SAS, PPA, and our clients well. Our shared goal is to empower DHS to be able to make the best use of these technologies for its own purposes going forward. We feel that this approach is far superior from a standard software/tool license with standard software training course credits. DHS staff will have the chance to work hands-on, side-by-side with a highly experienced policy research team that knows exactly how to structure data, build models, and deliver insights that inform research and public policy.

5) Describe experience or approach to working with an existing IT vendor to implement/integrate solutions.

SAS has been working with other IT vendors for our entire 38-year history. This experience encompasses implementing access engines that allow direct access to more than 100 different data formats from almost as many different software companies, as well as our more recent partnerships with hardware vendors and systems integrators to deploy high-speed, massively large Big Data or In-Memory computing environments. These relationships extend to many of our other customers who use SAS technologies for projects similar to the one SAS/PPA are proposing here. We appreciate that many of our customers agree with us that SAS is an ideal toolset for a robust analytics platform to evaluate decisioning. But beyond SAS' own business partnerships and the mechanical aspects of systems integration, the PPA team has extensive experience working with different IT vendors and working directly with SAS, itself.

In the early 1990s, PPA staff implemented an Oracle database to develop a reporting system mandated by the State of California to produce reports on the demographics and financial status on a program serving medically indigents in Los Angeles. The system known as MICRS was eventually implemented using Oracle technology, and therefore PPA staff had an opportunity to work with Oracle.

In the mid-1980s, PPA staff were involved in a project related to the implementation of GIS in Los Angeles County. PPA staff worked closely and exclusively with IBM to introduce a solution that would lead to the introduction of GIS in Los Angeles County. The project, which was led by IBM, resulted in a recommendation by County staff serving on the workgroup to establish the County's Geographic Advisory Body or GISAB.

And, of course, PPA staff have conducted a number of very successful projects working directly with SAS, which was in an IT vendor role. Below is a brief summary of three such groundbreaking projects that were completed with PPA working directly with SAS. The first one was a solution that was led by Dr. Toros and Dr. Moreno to implement an analytical data warehouse, currently known as the Enterprise Linkages project, to evaluate and accomplish three objectives: 1) to conduct outcomes studies of county programs using predictive analytics; 2) to implement a data-based solution that

would provide social workers with statistical information on the utilization of services by indigent adults accessing benefits through the County's General Relief system; and 3) to apply predictive analytics to assess risk for children.

In 2007, PPA staff piloted the concept of integrating administrative records from the Department of Community and Senior Services, Health Services, Mental Health, Public Health Children and Family Services, Probation, and the Sheriff Department in an effort to create an analytical data warehouse, and worked with SAS to assist in the implementation of a data integrated system to centralized administrative records across all County departments. PPA staff led this pilot project by defining the project and business objectives and the technical requirements of the Adult Linkages Project and by preparing extracts of the various silos of information while SAS performed the extract, link and load functions to create the analytical data warehouse.

Since the pilot demonstrated the feasibility of integration data across county departments, the pilot project was implemented as a production system. PPA staff worked closely with SAS project managers, analysts, data integrators and analytics experts to design a production system for case workers to query the database through a user interface and to obtain information on the outcomes and life cycle trajectories to better target public services to the needs of participants. The final result was the successful and timely implementation of the Enterprise Linkages Project, an award winning system to better target participants into the right type of public services based on empirical evidence from analytic models.

The next groundbreaking project in collaboration with SAS experts was the implementation of a data mining solution to detect the occurrence of fraud among clients accessing child care services in the County's TANF and the service providers. The implementation of a data mining solution to detect the likelihood of fraud in the County's public assistance programs was the result of a close collaboration among SAS staff, analysts, managers, social workers, fraud investigators in the Department of Public Social Services, and PPA staff.

Thanks to a close collaboration between SAS and County experts, PPA staff implemented a fraud solution that improved the fraud detection process by deploying predictive analytics to identify new fraud cases, detecting potential fraud earlier in the process, improving the quality of the referrals subject to fraud investigation, and detecting the presence of collusive fraud rings. Our approach was to bring the SAS team to work closely with social services fraud investigators in order to implement a system designed with the critical input of the fraud investigators. In fact, going through the process, everyone involved all had to become subject matter experts in crimes of fraud. Without an understanding of this kind of fraud, the IT vendor would not have been able a system that is fully owned functionally by fraud investigators. This team effort led to the implementation of a system that has been nationally recognized as a groundbreaking effort to detect fraud in public assistance programs. This collaborative work went on to be recognized as the 2011 Computerworld Honors Laureate for Data Mining for Welfare Fraud Detection. The project also received the 2012 National Association of Counties Achievement Award for Data Mining Solution for Fraud Detection and the 2012 Golden Eagle Award, Los Angeles County Quality and Productivity Commission for Data Mining Solution for Fraud Detection.

In recent years, as a result of a number of high profile cases involving child fatalities, the County's Board of Supervisors appointed a workgroup to develop recommendations to address the issue of severe child risk. Dr. Moreno played a leading role in the workgroup and recommended that predictive analytics and data mining be used to predict the risk of child abuse and maltreatment. Eventually PPA staff worked closely with SAS and the Department of Children and Family Services to identify all the data required to drive the predictive models and to launch a pilot to determine the feasibility of using predictive analytics to estimate severe, catastrophic risks for at-risk children.

- ***Project description:***

- 1) Identify project goals and objectives.***

The overall goal of this project will be to develop an advanced analytics platform to provide the capacity to DHS analysts develop and assess predictive models to support better decision-making and improve service delivery in human service areas such as child protective, homeless, behavioral health, aging, and criminal justice services. The goal in the first year is to show the value of the platform by developing one or more analytic models that can be implemented within DHS's current business processes for monitoring and managing child placements. For this 12-month project, SAS will provide all necessary resources – hardware, software, consulting -- directed at answering the set of the questions posed in this RFP that focus on outcomes for at-risk children.

By analyzing the currently collected data and taking into account the various touchpoints, triggers, and alerting already used by case workers, we will use the power of advanced analytics to improve the current processes. Are relevant variables incorporated into current alerting? Are thresholds set at appropriate levels? Could multiple variables in combination serve as reliable alerts for overlooked risks? Could eliminating a current trigger variable reduce the number of false positives without affecting the ability to identify early signs of future risk?

The platform will include SAS software installed in a SAS-hosted environment and consulting services provided by Public Policy Analytics (PPA). PPA brings to the project a consulting team with extensive experience developing statistically-sound real-world analytic models.

From a technology standpoint, SAS will provide a fully-hosted solution, providing the hardware, OS, and SAS software necessary to analyze DHS's data and produce models that can be implemented within the County's current IT and case management infrastructure. The software provided includes both tools for advanced data modelers and statisticians and data for less technical staff who want to explore the data (and evaluate models) using SAS Visual Analytics, a point-and-click web-based data exploration solution.

For this project, SAS will establish a platform capable of hosting up to 500GB of secure data. SAS regularly hosts PPI data, including data that are covered by HIPAA and FERPA regulations. We will implement all security features necessary to ensure the protection of all data used for this project.

From a consulting standpoint, PPA, led by Manual Moreno, Ph.D., and Halil Toros, Ph.D., brings more than 50 combined years' experience of leading and implementing data analytics projects, including

projects exactly like the work proposed here. For this project, the PPA team will focus on an in-depth analysis of data surrounding child placements. This topic has an advantage in that we can simultaneously consider several questions raised in the RFP:

- What's the best way to prioritize child welfare intake cases for response?
- Which child welfare placements are most likely to disrupt?
- How can we predict which child welfare reunifications are most likely to disrupt?
- Which child welfare clients are at risk of crossing over into the juvenile justice system?
- In which child welfare cases has risk of future harm been sufficiently reduced to close the case?
- Which child abuse cases are at highest risk of future harm?

In all cases, these are children who have already been identified as being at some risk. The child may have been removed from the home temporarily by law enforcement, removed permanently by court order, or receiving treatment or services from the county. The probability of risk is not 0. In the case of children within the foster care system, some children may have been returned to a parent (under careful watch), placed with a relative, in a temporary foster care placement for emergency purposes, in a long-term group home, in a placement moving toward permanency, and other placement options. An intervention has already taken place.

So, these are children at risk for whom some intervention has already taken place. To answer the questions above, an appropriate statistical model needs to account for:

- Differences in how the children entered the system (or re-entered with the possibility of multiple re-entry points)
- Differences in individual child need
- Differences in placement options (relative available, parental rights still in effect?)
- Additional interventions (legal, psychological, multi-agency strategic efforts, etc.)
- Differences in outcome (and different rules for defining those outcomes which opens the possibility of one child being served under two possible status definitions at the same time)

Suffice to say, such models can be complex, requiring a combination of current status measures and time-based measures. As we describe in our proposal, Dr. Moreno and Dr. Toros have extensive experience handling these sorts of data – using data from complex data warehouse records to build efficient, robust data marts that allow data scientists to uncover the hidden influence of many important variables.

But as Dr. Moreno and Dr. Toros have demonstrated in previous projects, a different data structure does not need to be built to answer each of the child outcome questions from the RFP. With forethought and planning, one or more data structures can be developed that can account for most, if not all, of the critical influential variables and allow DHS to answer multiple questions now and into the future. Once developed, those data structures can be automatically replicated as new data are available and models initially developed re-assessed to determine the degree to which they are still

applicable. This is the approach Dr. Moreno and Dr. Toros took in their work with Los Angeles County, creating data structures used by both that county and external social policy researchers.

For this project, PPA will work with DHS' own staff, exploring what data from the County's data warehouse could best answer these questions. PPA will show the County's own staff how to load data to the SAS-hosted environment and how to make use of the data tools provided. The County will have full insight into all work done by PPA and the work products developed will be reusable within the platform in the future.

2) Describe in detail the service(s)/consultation to be provided.

The project team will work with DHS to build one or models in the child welfare area during the first year as noted earlier. The immediate goal is to provide DHS staff with analytical tools to help in making critical case assessments and decision as well as formulating and evaluating interventions. The long-run objective is to extend the capacity of the platform to all issues related to social services and programs incrementally overtime. The platform design has the flexibility and scalability to model many different public policy questions and improve decision-making.

The SAS/PPA proposed platform covers two areas. The first is predictive analytics, which analyzes and discovers data from multiple sources to find patterns in data in order to build, assess and deploy models that predict similar outcomes in the future. The second is to use deployed models to take preemptive action through implementation of interventions and programs to avoid undesirable outcomes or attain desirable outcomes, as well as evaluate and assess these interventions with outcome analytics to improve outcomes and mitigate risk.

In the child protective services area, this approach can be translated into the problem of predicting the likelihood that a child will have a maltreatment outcome in the future, so that early intervention preventive resources can be strategically targeted. Then, the outcomes are evaluated over time to verify how well the intervention works. The analytic methods assist the child welfare services in evaluating the use of the data for understanding, estimating, and ultimately reducing or eliminating risks to the children it serves.

Building predictive models can be represented as a cycle where new analysis and modeling practices have to be rerun on new data to verify that the models still perform well and to respond to changes in data and environment. Moreover, the predictive analytics cycle is connected to outcome analytics to assess the effectiveness of the interventions, as elaborated later. Figure 1, below, shows the predictive analytics cycle.

THE ANALYTICS LIFECYCLE

APPLYING ANALYTICS IN AN ITERATIVE FASHION

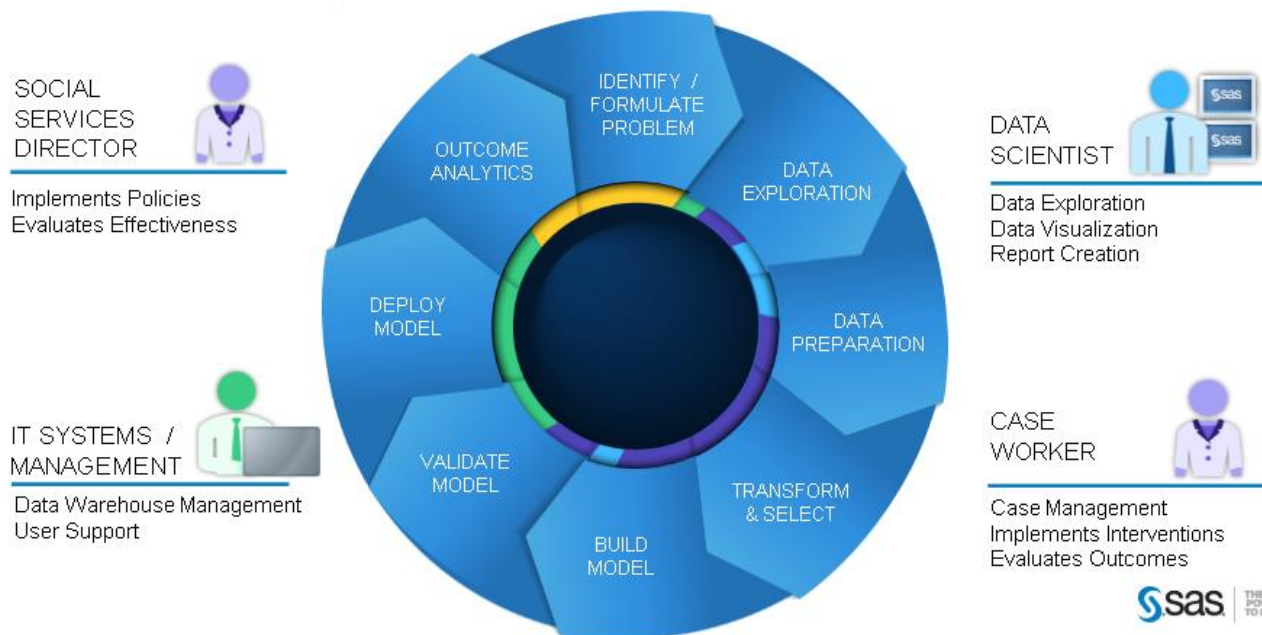


Figure 1: Analytics Lifecycle

Gathering Requirements. The cycle starts with defining the business problem or analysis objective, such as reducing the rate of maltreatment substantiations by predicting child abuse cases that are at highest risk of future harm. This will be done through extensive business requirements collection sessions with DHS, which will involve engaging in brainstorming sessions, interviews and focus groups with domain experts. The key is to gain a better understanding of the existing child maltreatment dynamics so that an appropriate predictive analytics approach can be implemented. At this step, the primary and secondary outcomes and prediction windows will be defined. For example, maltreatment outcome will be defined as the primary outcome as substantiated physical, emotional or sexual abuse and models will be applied to children at certain age to predict each child's risk of having a substantiated maltreatment before reaching an older age. Risk stratification will be also defined in such a way that risk scoring and intervention assignments will be optimized in models based on these definitions. For example, certain high-cost intensive programs will be targeting high risk cases to make sure that an adverse outcome is avoided in the future. On the other hand, for low risk cases, cost-effective broad community-based programs will be offered.

Building Data Marts. The next step is data access and discovery, which refers to reading and understanding data residing in the DHS data warehouse. We have reviewed the list of data sources listed in the RFP. Without additional details on all of the variables within each data set, we could not identify in advance the complete list of data sources and elements that would be relevant here. However, we certainly expect to integrate data from sources that capture data on child need, current and historical guardianship/foster care status, additional current and historical data on legal status

such as exit to or entry from juvenile justice, and any interventions implemented. Where the current data system already implements flags, alerts, or otherwise identifies children for a specific treatment option or case worker action, we would like to have those data points as well. In many cases, such as with the termination of parental rights, that is a critical trigger that must be considered in a model, but it is a time-based event that is dependent on several other factors. We would want the necessary data points that capture not only “should that process have been initiated?” but also, “has that process actually been initiated?”

To build the necessary data marts, PPA will rely mainly on SAS Enterprise Guide, which provides a point-and-click interface to structure data flows. SAS Enterprise Guide has the advantage of being able to perform both SQL-type data functions via a point-and-click interface and also running more traditional SAS code.

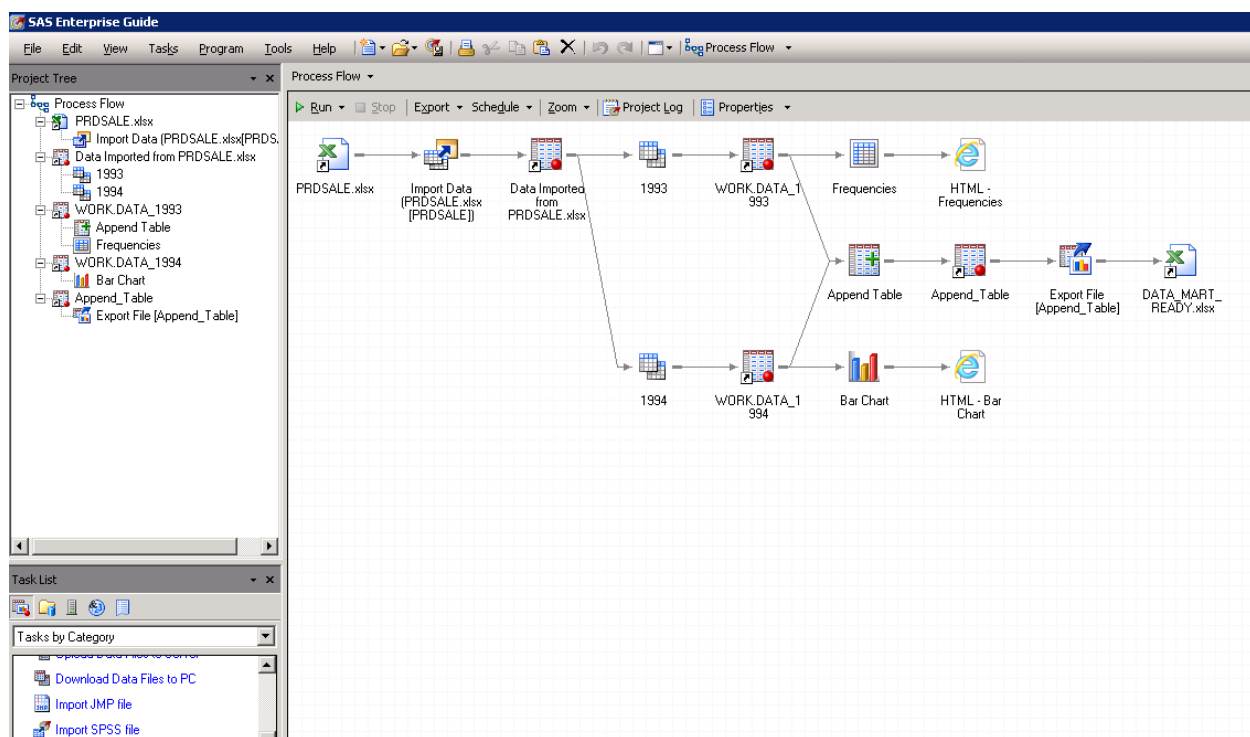


FIGURE 2: Example data flow in SAS Enterprise Guide.

These data will also be loaded into SAS Visual Analytics, which provides drag-and-drop data exploration tools for evaluating the data mart structures as they are developed. SAS Visual Analytics Data Explorer is an advanced interactive data visualization tool will help the analysts explore the data from multiple sources to determine which variables might be relevant to predict child maltreatment outcomes. The objective is to collect all data available to let the platform find what is most relevant. Visual Analytics Data Explorer provides an interactive environment to visualize big data very rapidly using in-memory analytics.

Using several statistical techniques, relevant data elements are identified and checked for completeness, redundancy and correct form. In addition, nonlinearities in risk factors (e.g. the effect of prior interventions may increase in a quadratic fashion) as well as interactions between underlying risk factors (e.g., the presence of one factor, such as a caregiver's progress with a case plan, modifying the importance of another, such as time since the last intervention) will be discovered. Later, these effects will be tested in the model building environment. All relevant predictors are selected that are related to child maltreatment such as characteristics of the child, caregiver, and household, care and protection histories of the case and related cases as well as all other relevant data elements like hotline referrals and derived data fields like time between incidents. All relevant risk factors from other agency data sources will be integrated to the datamart.

The next step is to prepare and load the data to the datamart. All historical data for the identified predictors and outcome variables will be prepared which is always a key challenge. Raw data is often unsuitable for model building and extensive preprocessing is required. SAS software offers an extensive library of functions and tools to clean the data, eliminate redundancy, identify and treat missing values, ensure data consistency, transform data elements, generate calculated fields and prepare the data for analytics.

One key element in this step is to offer easy-to-use stored processes to generate cohorts. Models will be built based on longitudinal analysis of selected cohorts such as children at a certain age who entered into the child welfare system (started a new case episode) between 2008 and 2010. For predictive models, target sample with primary (cases with maltreatment) and secondary outcomes (cases lacking maltreatment) will be selected over the time periods that define the study cohorts. For outcome analysis, treatment (children received interventions) and comparison (children with no intervention but similar to the treatment group) groups will be generated to evaluate the impact of an intervention.

Preparing data for analysis will be done by transforming the raw transactional data into analytics-ready case histories. Each row will represent a dimension of the case episode over time starting from the first month thru n number of months such as investigation history or placement history. Then, these history arrays will be transformed into model inputs using analysis functions offered by the platform such as event flags (presence of protective parent in the household), number of measures to date (number of prior investigations), time between events (between referrals), and so on. The final dataset will have a row record for each case episode where each episode will contain all relevant variables. This data structure will show the accumulating risk trajectory of the case until a positive (like reunification) or a negative (like maltreatment) event takes place. Every time a new data is added to this row, the trajectory changes. The risk trajectory is modular in the sense that new information can be added (like new data sources coming from a new hotline). This data structure, based on history arrays of cohort cases, gives a dynamic capability to analysts to interactively assess the changing impact of all relevant inputs over time.

Finally, the prepared data will be loaded into a data mart specific for child welfare services.

Modeling Outcomes. The model development phase of this project requires three main efforts: building the models, evaluating and validating the models, and deploying the models. In practice, this is an iterative process by which models are developed, tested against sample data, tested against population data, and evaluated again for further refinement. But each of three main efforts – building, evaluating, and deploying – is described below.

Building the Models. The next step is the core of the predictive analytics cycle—building the predictive model. Using all selected predictors for child maltreatment, the platform will run several algorithms against the data.

The models may predict events such as the likelihood of maltreatment. They may also predict time to an event such as how long will it take for a maltreatment. Finally, the models may predict the severity of the risk such as the level of abuse. The analysis will be run on a subset of the data which is called training data. Predictive models will be built for child maltreatment outcomes using SAS Enterprise Miner tool which is an advanced data mining workbench with extensive modeling capabilities that includes numerous predictive algorithms and advanced data transformation capabilities. Enterprise Miner will be also used to mine text data if available in electronic format. Text mining will provide us insight from the information and comments contained in the case files.

The risk scores will leverage all these advanced algorithms as well as non-linearity and interactions between risk factors. The risk score will be made of several predictors with different contributions to the score for each episode. This probability score will represent the likelihood that the child who has begun the case episode will have a substantiated maltreatment by some age. The model will rescore a case episode whenever the conditions of the episode changes such as a new caregiver or re-entering the child welfare system. The scores are dynamic and can change over time, allowing case workers to distinguish high-risk and low-risk case episodes. As elaborated later, outcome analytics explores the causality by assessing which factors contribute to certain outcomes and/or which interventions perform better to mitigate risk.

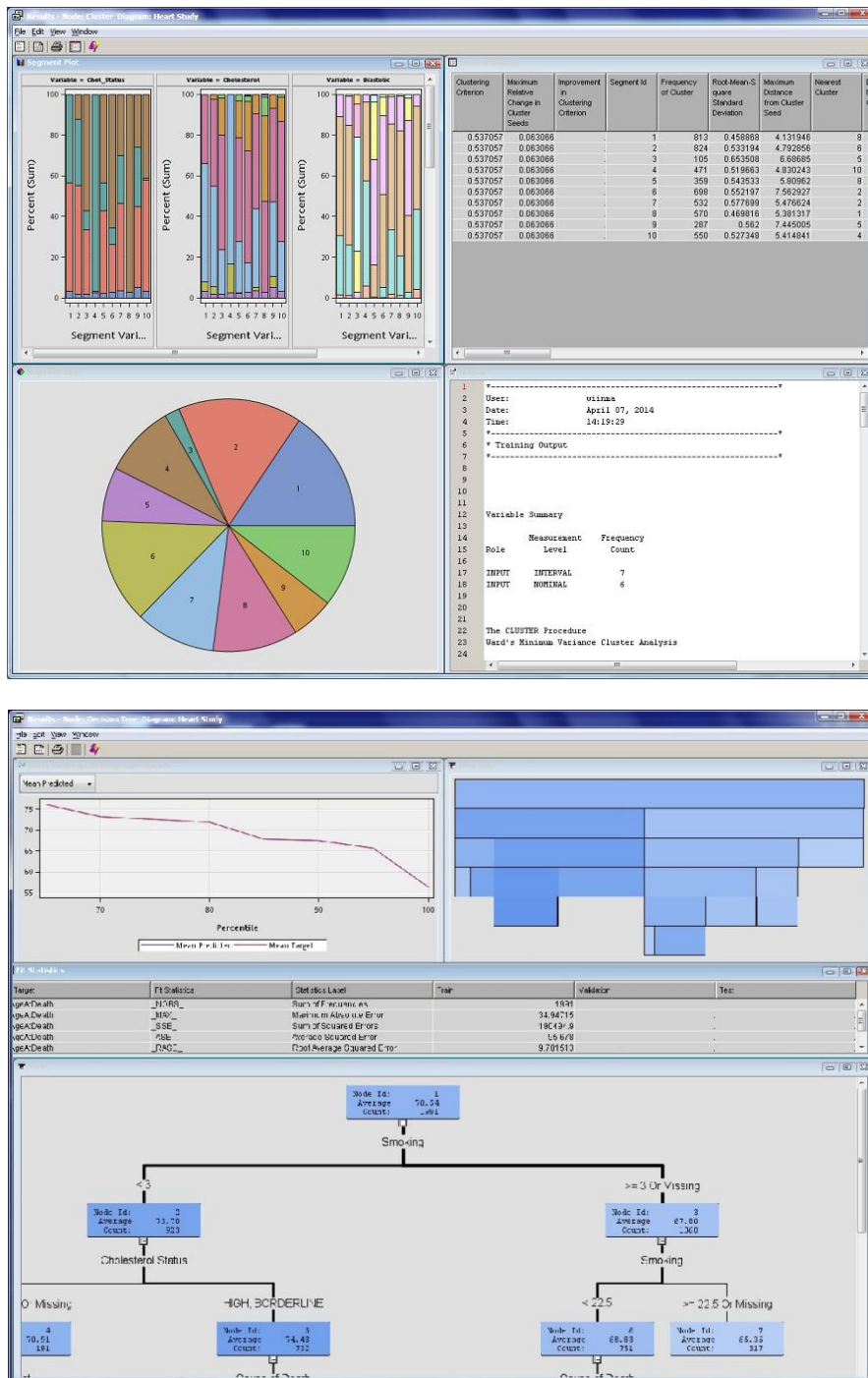


FIGURE 3. Example Enterprise Miner Models: Clustering and Decision Tree

Validating the Models. The predictive powers of the models will be assessed by running them against the validation and test data sets. A champion model is identified after comparing several models the one that is most predictive is elected as the champion model. Model comparison is an iterative process that will require data analysts to build multiple models over time. The champion

model will be the one that will predict child maltreatment much better than a random process or relative to a baseline model if available.

Model building is tuned to optimize model sensitivity (detecting at-risk children) and model specificity (minimizing false positives—children scored with high risk but not maltreated) which is assessed effectively by SAS Enterprise Miner using the model comparison and assessment tools in that software. Depending on the outcome, the trade-offs between model sensitivity and specificity will be optimized. For example, predicting serious injury or harm will require a model with extremely high sensitivity (rarely failing to assign a high risk score to cases involving serious injury) and relatively low false positive rate (assigning a high risk score to a truly low risk case).

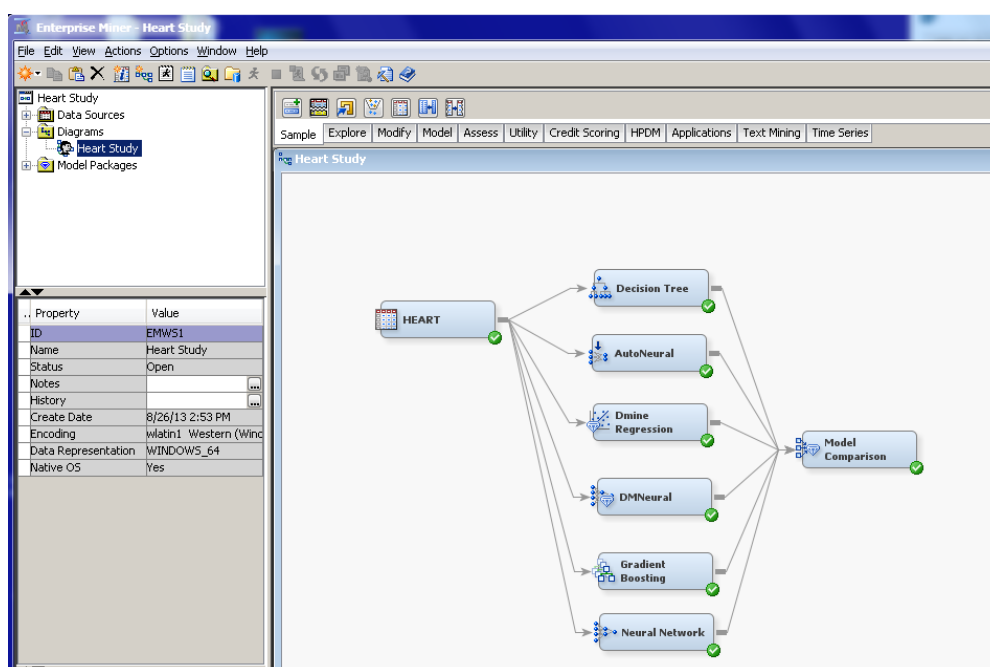


Figure 4: Enterprise Miner Model Comparison Node

Deploying the Models. After the champion model is selected based on the cohort data, all previous and new incoming child welfare cases will be scored with this model. Scores will be generated using SAS Enterprise Miner and cases with high risk will be identified. The platform will present to workers why a case has been selected as a high-risk case by quantifying the relative importance of risk factors represented by sub-scores. The addition of all contributions yield the final score which can be integrated into DHS' current case management system.

Outcome Analytics. The last step covers the evaluation and analysis of predictions as well as assessing the impact of interventions built on the outcomes of predictive models. All scored cases will be loaded to the SAS Visual Analytics platform so that they will be studied, visualized and reported interactively. The SAS Visual Analytics interface will enable DHS staff to visualize case level data to assess the risk of the cases in question. The interface will also present group and population level visualization and reporting for higher level analysis such as comparing high and medium risk groups.

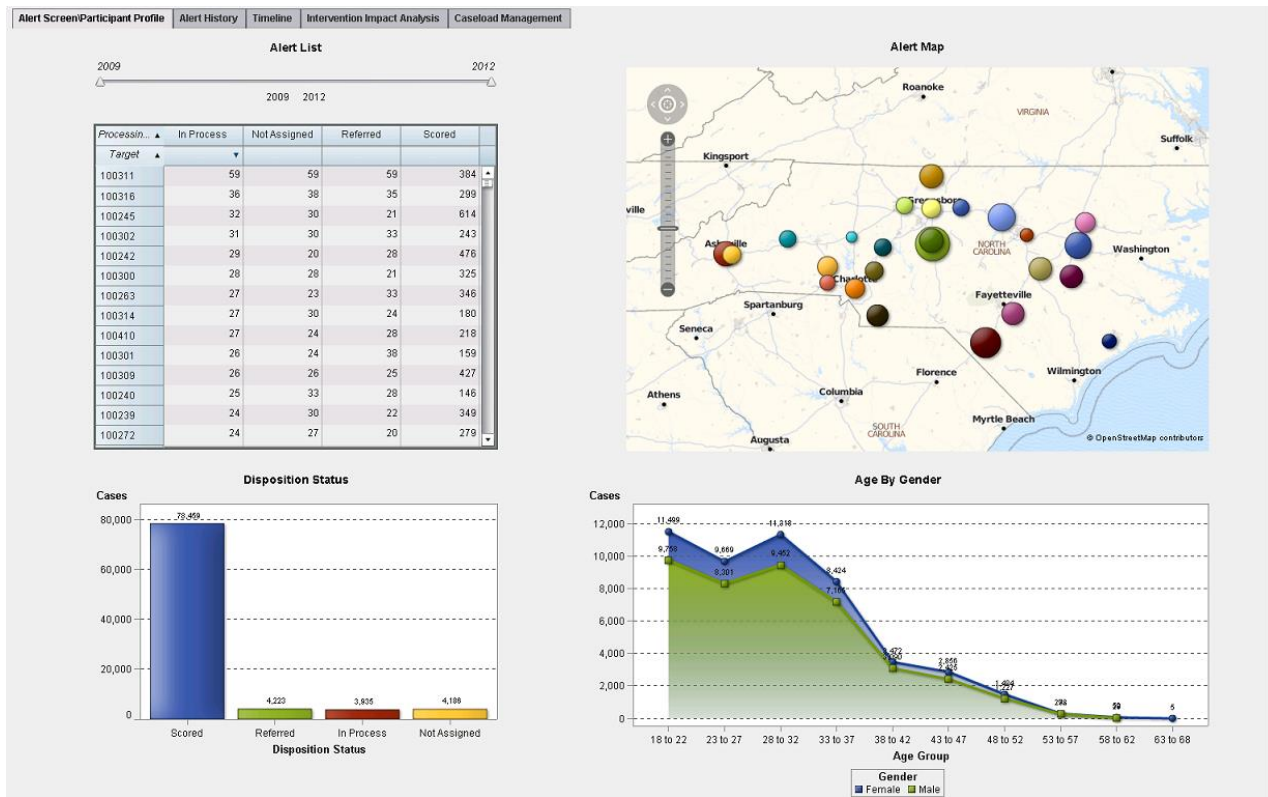


Figure 5. Examples of SAS Visual Analytics Reporting

Finally, the platform will provide a SAS Visual Analytics interface to visualize and report outcomes after scored cases are assigned to interventions and programs. When the outcomes of the interventions are assessed using outcome analytics, DHS will not only be able to better assess the case risk levels represented by the risk scores, but also will identify the programmatic factors that most critically affect risk (e.g., the impact of case worker visits, the impact of particular interventions to date, etc.). This functionality will enable DHS to fine tune policies and programs affecting these children. The impact of programs will be re-entered as a new factor into models so that future reporting can take into account those program changes.

This predictive analytics platform is described above focuses on predicting child maltreatment. The solution will produce a datamart for the children served by foster care programs. However, the same data mart has the flexibility to predict any other child welfare outcomes by running different models based on this data. These risk models may be related to child maltreatment as described. Or, other models can be constructed to answer the analysis questions asked earlier such as predicting the likelihood of disruption of child welfare placements, reunifications or the likelihood of crossing over into the juvenile justice system. The analytical layer built on top of DHS data warehouse will have the capability to predict and assess any analytical problem.

3) Describe how the program will be integrated with other information technology and tools.

While the models will be built outside of the County's Data Warehouse, using data exported to the proposed analytics environment, we will ensure that the findings of the modeling can be re-integrated into the regular workflow of case workers who must manage these cases. This can be accomplished in multiple ways, depending on what is learned from the analytic modeling done. The following are just some examples of the ways in which lessons learned from the modeling process can inform improvements in the operational case management system.

Elimination of variables currently used in alerting if they do not prove meaningful in the more rigorous statistical analysis. For example, if the current case management system directs users' attention to variables or factors that, based on a scientific analysis, simply do not hold much importance, those screens/reports can be modified to de-emphasize or eliminate information that might mislead case workers. The converse can be true, as well. We might identify certain critical variables/factors that were less prominent in the case worker tools that should be more emphasized, either through the software or just through training.

Revision of cut points / thresholds for predictors and output already captured by the system. Many case worker systems are set up with certain triggers to alert case workers of required steps or points for intervention. It may be the case that the system must be modified to implement more precise thresholds for those alerts. For example, it may be that, for certain children, efforts to find a permanent home are not initiated until Month X. We may learn from our research that for many children, Month X is sufficient, but for others (identified by unique combinations of data we are currently collecting), we must begin that process two months earlier if we are to meet permanency goals for those children. As another example, many times case management rules / systems require follow-up with a child/case within X days under certain circumstances. We may learn from our

research that the particular trigger for follow-up has been set too late, especially for some kinds of cases that we can reliably identify in the system.

New alerting within the system. Based on our research, we may identify a set of variables that together serve as a scoring algorithm that can reliably predict our outcome. While it may require more work to implement those models in the operational case management system, DHS will have full access to all aspects of any model built and DHS will know which variables should be used and how those alerts can be calculated. To that end, where we have a choice of two equally sound statistical models, we will give preference to the model that is more easily implemented in such a system. For example, a decision tree model may be just as accurate as a neural network model or other complex statistical procedure, but the results of a decision tree model are much easier to implement in traditional operational case worker system. Where we have such choices, we will take into consideration the more pragmatic aspects of how models can be deployed.

Score the data within SAS and return a scored data set to the operational system. This is a very straightforward process if the data do not need to be scored in real-time. Data from the operational system, as they are in this project, are exported to the SAS-hosted environment and scored. The output of that scoring process can be exported to a server where the operational system can collect the file for re-integration into the reporting. The platform we are deploying here is for decision support and research, but SAS does implement very high speed scoring in a variety of data warehouse software. We can discuss that as a future option but are not recommending that here.

In these ways and others, we can take the analytic insights and models developed on this platform and integrate this into the current operational system. We think this approach is preferable to attempts to build a separate software tool that would require extensive case worker training and may, in fact, create an additional administrative burden for use. This model takes advantage of all of the software development, implementation, and training already done to allow the current case worker staff to manage cases. But it also provides a pathway to greatly improving the scientific rigor of those processes.

This approach provides an additional benefit. By de-coupling the science of the decisioning process from the software used to implement case management, DHS will have an analytics platform for an objective analysis of the strengths and weaknesses of the various other software systems in use for case management, alerting, and so on. Too often, the scientific basis for whether a particular survey tool or decisioning software comes only from the company that is selling that tool or software. The platform we are proposing not only allow DHS to explore its own data in regard to child outcomes, but to re-evaluate the reliability and validity of various case management tools that purport to have identified the key critical measures, sometimes based on scant statistical rigor.

4) Provide a timeline for design and development.

The following is a draft timeline that has served as an appropriate starting structure for similar projects. In the first week of the project, SAS/PPA will meet with DHS staff to refine this timeline to better reflect the final parameters of the child outcomes project we define together.

The dependencies in the project plan are the contract signing, availability of data to the team, and several planning and review meetings noted in the timeline. The main activities are the structuring of the data into analytics-ready data marts, development of one or more predictive models, and implementation of reporting using SAS Visual Analytics. The overlap in those activities in the timeline reflects that these are iterative, collaborative workstreams. PPA, based on consultation with DHS IT, DHS researchers, and case workers may identify an initial data source that could be used for a model. After initial modeling efforts, the team may realize that another, readily-available data source could be added to the data model to improve the original predictive model. Those data are added to that data structure and a new model is built. The same iterative process takes place for reporting in SAS Visual Analytics. While the SAS/PPA team has extensive experience doing this kind of work, we recognize that every DHS agency is in some ways different and there is not a single one-size-fits-all data model. There is not one predictive algorithm with pre-defined statistical parameters that will work in every case. Our schedule reflects the reality of developing data structures and models in a collaborative working environment.

On the other hand, we recognize the need for a schedule that includes critical milestones where work completed can be shared and reviewed with the DHS team and any other staff DHS deems appropriate. Thus, we will include a time for a Preliminary Results and Tuning Workshop to review all work to date and chart a path to successful project completion. Finally, our schedule includes multiple touchpoints to ensure an appropriate handoff of models, data, and other insights that need to be integrated into the current production environment. The final step will allow for integration of project insights into the current case management system managed by your IT vendor. In this way, our schedule allows for collaborative, innovative work between the SAS/PPA and DHS teams, but also ensures that the results of those processes can be applied to current, active cases being managed by the County – research-based findings put into action.

Draft Implementation Timeline

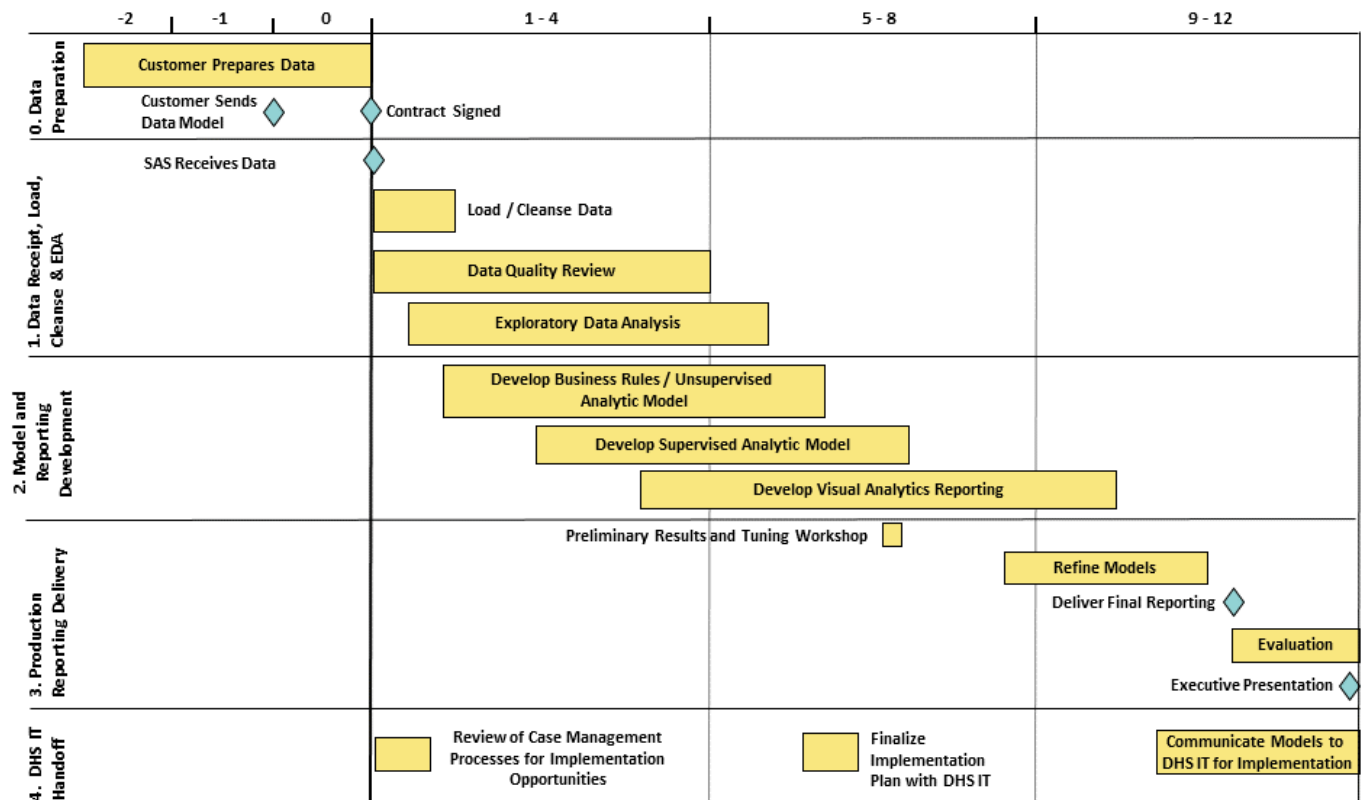


Figure 6. Draft implementation timeline.

5) Provide examples of tools/systems already developed. (include in appendix, does not count against the 25-page limit)

Within the Consulting Services section, we have included screenshots of the essential technologies to be deployed for this project: Enterprise Guide, Enterprise Miner, and SAS Visual Analytics. We would welcome the opportunity to demonstrate this functionality for the DHS team.

SAS hosts multiple interactive demos of SAS Visual Analytics, including examples from Education, Health Care, Patient Safety, and Government Accountability applications. Those demos are available here: <http://www.sas.com/software/visual-analytics/demos/all-demos.html>. SAS also has a YouTube channel dedicated to our Visual Analytics solution that demonstrates some of the key functionality: http://www.youtube.com/results?search_query=SAS+Visual+Analytics

We welcome you to try these online demos, but we would welcome the opportunity to demonstrate these technologies in person and would be glad to answer any questions you have concerning our capabilities.

6) Describe the staffing plan:

• List staff, their roles and each of their qualifications.

For this project, SAS will provide all necessary staffing resources to manage the project and serve as system administrator and other fundamental roles to support the deployment of the platform. PPA will provide staffing resources necessary to conduct all data and analytics consulting efforts. The following staff will be deployed:

Dr. Manuel Moreno, Project Director and Social Scientist. Dr. Moreno will be involved in collecting business requirements and scoping the analysis problem with DHS. He will also be involved in the conceptual formulation and design of the models, as well as in the assessment, validation and evaluation of the predictive tools.

Dr. Halil Toros, Lead Data and Analytics Scientist. Dr. Toros will lead the PPA effort in designing, building, assessing and deploying the data models for the project, accessing and exploring all the data available and loading the relevant data to the data mart. Finally, he will be involved in building the visualization and reporting interfaces for the project. He will be coordinating with SAS to deploy the solution in the hosted environment and will be collaborating with DHS analysts during the project and will also be instrumental during the knowledge transfer to DHS.

Dr. Dennis Culhane, Social Policy Subject Matter Expert. Dr. Culhane will participate as a subject matter expert and will provide general consulting services for this project. He will also provide consulting services to assist in the design of the predictive models.

Dr. Emily Putnam-Hornstein, Social Work Subject Matter Expert. Dr. Putnam-Hornstein will participate in the project as a subject matter expert and will provide general consulting services to design, implement and assess the decision support/predictive tools for this project.

• Resumes

Please see attached resumes in Appendix 2.

• References

Name, Affiliation, Contact Info	Relevant Experience
Susan Clare, Executive Director Virginia Office of Comprehensive Services (804) 662-9830 Susan.Clare@csa.virginia.gov	The Virginia Department of Social Services and the Office of Comprehensive Services, licensed a SAS-hosted analytics platform including SAS Social Network Analysis (SNA) to inform the delivery of high quality, targeted, and cost-effective services in child welfare and to improve well-being outcomes for families involved with child welfare throughout the Commonwealth.

Name, Affiliation, Contact Info	Relevant Experience
<p>Philip Browning, Director</p> <p>Los Angeles County Department of Children and Family Services</p> <p>(213) 351-5600</p> <p>BrownP@dcfs.lacounty.gov</p>	<p>PPA personnel provided initial consulting services to assist the department in piloting the application of advanced analytic methods to estimate risk for children. PPA also worked with DCFS staff to data mine child welfare data to conduct a study on the adult outcomes of foster children released from foster care between 2002 and 2004.</p> <p>PPA also provided consulting services to Director Browning when he was Director of the Los Angeles County Child Support agency to develop predictive models to estimate an equitable budget allocation for this department and a comparison to all child support agencies in California.</p> <p>PPA also worked with Director Browning when he was the Director of the Department of Public Social Services to develop and implement the Enterprise Linkages Project to provide analytics support to social workers providing assistance to General Relief participants.</p> <p>PPA also provided program and outcome evaluation services using predictive analytics to Director Browning when he was the Director of the Department of Public Social services in Los Angeles County.</p>
<p>Phil Ansell, Acting Chief Deputy Director</p> <p>Los Angeles County Department of Public Social Services</p> <p>(562) 908-8309</p> <p>PhilAnsell@dpss.lacounty.gov</p>	<p>PPA staff implemented an integrated data system for the Department of Public Social Services that links multiple county departments—public social services, health cluster, law enforcement public safety, community and senior services and child welfare systems—in an analytical data warehouse known as Enterprise Linkages Project (ELP). ELP enhances decision making and analytic ability to evaluate programs and inform data-driven decision making. Social workers use ELP to provide participants in the general relief system with targeted program services based on ELP data.</p> <p>Additionally, since the implementation of welfare reform, PPA staff have been evaluating social services programs for DPSS using administrative data and predictive models to understand program outcomes and improve service delivery based on predictive analytics.</p> <p>PPA staff also provided consulting and technical services to implement a data mining system based on predictive analytics to detect the likelihood of fraud in the CalWORKs and IHSS programs.</p>

3. Budget and Budget Description

Please provide a budget that shows the cost per line item, any matching funds, total expenses and total revenues. Include a budget narrative that explains the purpose of each line item and how amounts were calculated. The budget should clearly relate to the Narrative.

SAS/PPA are proposing a SAS-hosted solution that includes a one-year (12-month) license for multiple SAS software solutions and consulting provided by Public Policy Analytics, LLC (PPA). Consistent with the goals of this project, we are providing a single, integrated cost estimate for all hardware, software, and services consistent with the terms below.

SAS looks forward to putting in place a mutually agreeable contract for the services and software license described in SAS' response to the RFP. Please note SAS' response does not constitute a contract and is contingent on the parties' agreement to separately negotiated, mutually acceptable contract requirements and terms should SAS be selected as the vendor. The contract terms and requirements of the RFP and SAS Solutions OnDemand Master Hosting Agreement will serve as the basis for establishing a contract with such additions and changes mutually agreed to by the parties. Neither the RFP, nor SAS' response shall be deemed to constitute an agreement between SAS and the County of Allegheny.

We offer this proposal and the following cost estimate as just that: an estimate. We would welcome the opportunity to discuss with Allegheny County DHS more about your own goals for this project and how we can provide a cost-effective, useful analytics platform for enabling DHS to answer questions about at-risk children and other topics (e.g., elder abuse, drug addiction) mentioned in the RFP, but not addressed here at all.

We also note that the proposal here is just one example of a possible approach to answering these questions. We could, in an alternative project, implement a production system using SAS Social Network Analysis to measure and monitor child outcomes, as we have done in Virginia. We could focus on a more large-scale integration of data across multiple agencies, focusing on building integrated data structures as we have done for Los Angeles County.

We could, conversely, focus solely on data mining and model building without regard to any kind of visualization or reporting to provide statistical input to more traditional social science reports, as both SAS and PPA have done for other projects. But we feel that the solution we have proposed here – an analytics platform that offers statisticians the best available statistical tools and non-statisticians SAS' leading edge data exploration and visualization tools – is the best fit for this project. We are not seeking to replace the current case management system or to build a potentially duplicative system; we are seeking to improve the system in place with research-based analytic insights that can improve the work already underway.

For the project as proposed here, our offering includes the following:

Solution/Service	FYF	Additional 12-Month License
SAS hardware hosting (12-month license)	Included	included
SAS secure data storage (up to 500GB of data and 2TB of workspace)	Included	included
SAS Software (Analytics Pro, Enterprise Miner, and SAS Visual Analytics)	Included	included
SAS Project Management / Systems Administration	included	included
PPA Consulting (up to 4000 hours over the 12-month term)	included	T&M
Total Cost	\$ [REDACTED]	[REDACTED]

Should Allegheny County be interested in expanding the project from this initial 12-month project, we would be glad to discuss how this initial project, focusing on outcomes for at-risk children, could be leveraged to provide other research-based insights. Two potential directions for such work are the inclusion of additional data and the expansion of interactive visualization capabilities. In terms of data, based on our experience with the ALP/ELP projects, we have seen how, once DHS staff understand how technical data linking challenges can be overcome, DHS staff immediately realize that other available data may be of use. Quite often, the only reason that such data are not already in use is because of technical limitations within the systems that store those data. Data entry software that is mainly for simply recording data can be very limited in its usefulness for data modeling and analytic work.

In terms of interactive visualization, one of the best tools now available to public policy researchers is a robust spatial analysis (GIS). Spatial analysis is the means by which spatial data is converted into actionable intelligence and results. It leverages the analytic aspects of GIS to answer spatially-based queries. Spatial analysis equips the enterprise with new analytic capabilities and provides the ability to answer a new set of business critical questions. But these technologies do not include only geographical maps. Other kinds of maps, such as social network mapping, provide a map of the relationship between entities based on relationships identified in the modeling. The field of interactive visualization of data is rapidly evolving, and SAS and PPA remain at the forefront of the deployment of these technologies for public policy research.

Finally, we note that the same SAS software propose for reporting for this project—SAS Visual Analytics—has the added benefit that reports developed on this platform can be easily deployed on a mobile device like an iPad. With merely a few clicks, reporting generated on a desktop system can be sent to a registered, authorized iPad user. While graphs and tables can still be exported for

reporting in traditional document-based research, the future is interactive and mobile, and all of the reporting developed using SAS Visual Analytics is already being used by mobile device users.

We agree with DHS' observation, at described in the RFP, that the kind of advanced data and analytic toolsets that are often used by other government agencies and researchers have yet to become widely adopted by human service agencies. We share your concern that the best available tools and methods are not already widely adopted given the populations (children, the homeless, the elderly, and other at-risk populations) and kinds of issues (hunger, maltreatment, physical safety), human service agencies must address. We can think of no more important use for these technologies than to assist human services agencies in fulfilling their mission.

For countless public and private sector customers, SAS, assisted by consultants like the SAS experts at PPA, has implemented and managed decisioning platforms that have greatly advanced the degree to which our customers are able to make data-informed decisions to improve their work. The SAS/PPA team has been able to navigate the many challenges faced by human service agencies to implement this kind of system for a number of forward-looking localities and states that have been willing to take on the challenge of innovation. We see in Allegheny County a DHS agency that is looking for a partner to take on that challenge. We would welcome the opportunity to assist you in reaching your goals.

Appendix 1 – Example of Analytical Platforms Implemented

SAS implemented the Enterprise Linkages Project (ELP) in Los Angeles County in 2012. Dr. Manuel Moreno and Dr. Halil Toros of PPA were the project director and technical leads for the County.

ELP is an integrated data system which is used to link administrative records from multiple public agencies into an analytical data warehouse, offering a unique mechanism for providing the type of comprehensive information that is important for understanding complicated problems or the complex needs of vulnerable populations served by the County agencies. In turn, this information is used in making data-based policy and program decisions that translate into more effective and efficient policies. The ELP application also provides a web-based interface that allows authorized users from Department of Public Social Services (DPSS) to perform searches using specified criteria in order to obtain summarized views of all services and the cost to County departments for providing general relief (GR) recipients and indigent adults with these services.

The ELP tracks the service utilization of GR and other public program participants across a spectrum of publicly funded health, mental health, social and other services as well as the costs associated with such service utilization, allowing for the formulation of a complete picture of County resources expended upon participants in the GR and other public programs. In addition to records maintained by DPSS, the ELP integrates records from the Department of Health Services (DHS), the Department of Mental Health (DMH), the Department of Public Health (DPH), the Department of Children and Family Services (DCFS), the Department of Probation, the Department of the Sheriff and Community and Senior Services (CSS). Given its capacity to track the service use of GR recipients and other persons across different County agencies, analysis of ELP data can help foster collaboration between County agencies, and identify redundancies in services, resulting in the potential for cost avoidance and cost savings. More specifically, information from the ELP helps to produce both a more accurate characterization of the comprehensive needs of GR and other public program participants as well as a more complete understanding of the extent and cost of their interactions with multiple public service systems. This is particularly important in the case of GR participants, who, due to their complex health, social and economic needs, are frequent users of County health, mental health and additional services and constitute some of the most vulnerable residents of Los Angeles County.

Moreover, the longitudinal structure of the ELP allows for the tracking and comparison over time of different cohorts of participants in public program (e.g. long term vs. first time GR participants). This is quite useful, as it allows for the identification of important characteristics or factors that may be associated with certain patterns of utilization of County services. In turn, these factors or characteristics serve as the basis for the targeting of special interventions towards certain groups of GR recipients or other participants in public programs. For example, access to ELP information enhances the application process and approval for Supplemental Security Income (SSI), thereby leading to additional cost avoidance across County Departments.

Figure A-1 shows the architecture of the ELP which has the data integration and analytics components together with the web interface for DPSS staff to access the information on their GR clients.

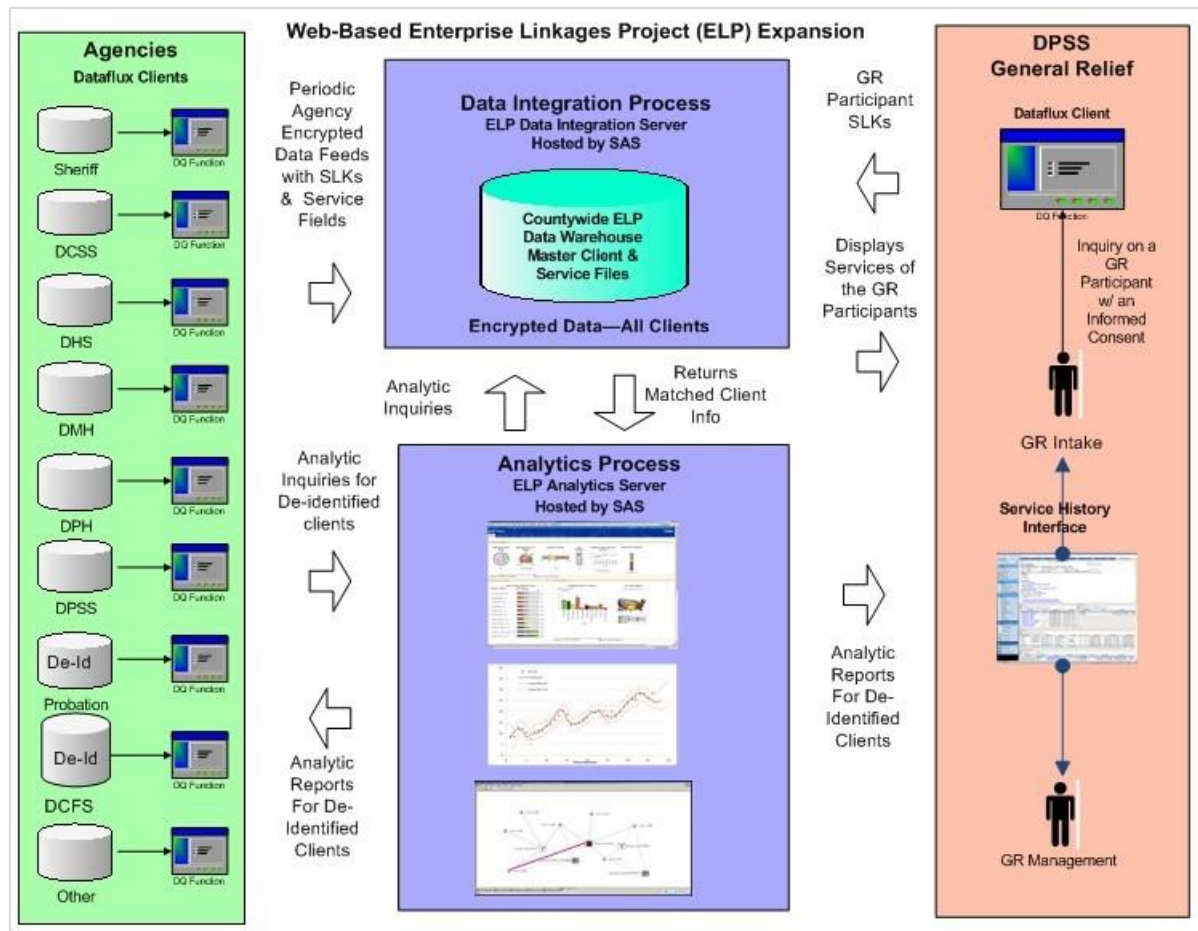


Figure A-1- The ELP Platform

The analytical capabilities of the platform enables analysts to use SAS tools to study County programs to monitor and assess outcomes and inform policy-makers and advocate groups on the characteristics of client populations, as elaborated earlier in the proposal. The platform also allows analysts to generate prompt information on a given question, such as the emergency room utilization of GR recipients during the last 12 months, which is shown in Figure A2. Using the ELP data and SAS EG tool, the question could be answered interactively, which would take weeks or months before.

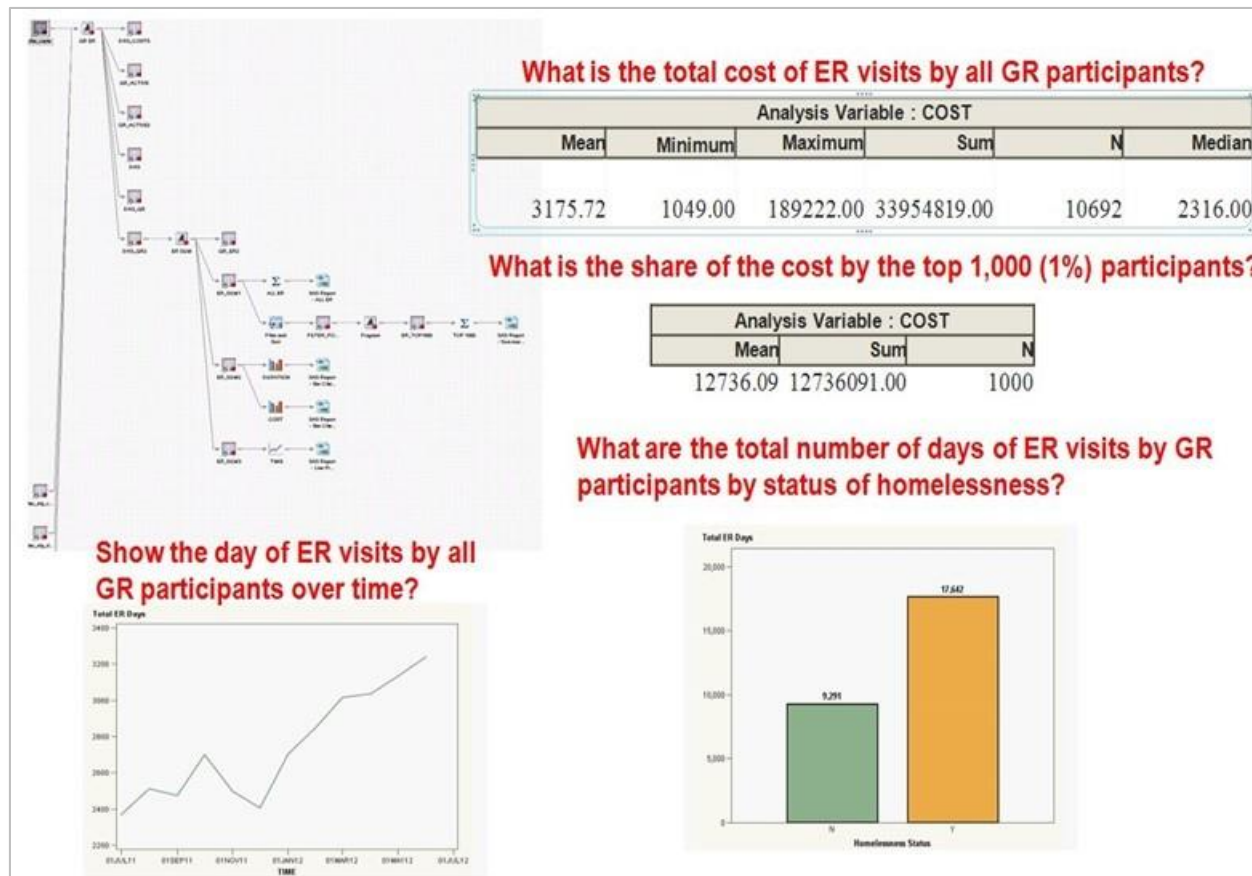


Figure A-2- Interactive ELP Analytics

Moreover, the ELP can be used as a predictive analytics platform. The next stage of this project will integrate the prediction of likelihood of SSI approvals into the ELP. Unless a consent is available, SSI advocates cannot browse service utilization of the GR participant. Predicted scores will provide advocates with a powerful tool to identify those participants likely to be approved for the SSI and refer them to the program and provide customized services to these clients for a quick approval so that disabled adults move to higher income and leave the General Relief program, thus maximizing County savings.

Currently, SAS is working with Los Angeles County DCFS to develop predictive models of child maltreatment using ELP data.

Figures A-3 thru A-5 show examples of screenshots of the ELP user interface. Figure A-3 shows the initial screen after the searched cases are selected. When a case is selected from this screen, more detailed information is shown. Figure A-4 shows the details of the participant, a timeline of all DPSS programs received overtime as well as details of all program engagement. Figure 5 shows the timeline of services from other departments and the details of the health services.

SAS® Enterprise Linkages Project SAS

Help | Cases | Details | Dashboard | Filter | Data Through: 07/31/2012 | Log Off

Filter Panel

- ▶ CASENO-PID
- ▶ CIN
- ▶ Case Name
- ▶ Employable
- ▶ Disabled
- ▶ Medi Cal
- ▶ Age
- ▶ Homeless
- ▶ GR Effective Date
- ▶ Time On GR
- ▶ Current Time On GR
- ▶ GR Eligible Now
- ▶ Veteran
- ▶ Current Drug Treatment
- ▶ SSI Current Status
- ▶ Housing Subsidy
- ▼ Authorized
 - ☒ All (6)
 - ☐ Y (6)

Cases

CASENO-PID	CIN	Case Name	Employable	Disabled	Medi Cal	Age	Homeless	GR Effective Date	Time O...	Current Tim
			U	Y	N	56	N	12/06/2011	7months	
			E	N	N	53	N	11/09/2011	18months	
			U	Y	N	37	Y	08/23/2011	31months	1
			U	Y	N	21	Y	01/13/2011	35months	1
			U	Y	N	56	Y	12/28/2011	59months	
			U	Y	N	50	N	07/01/2011	67months	1

Figure A-3- The ELP User Interface Initial Screen

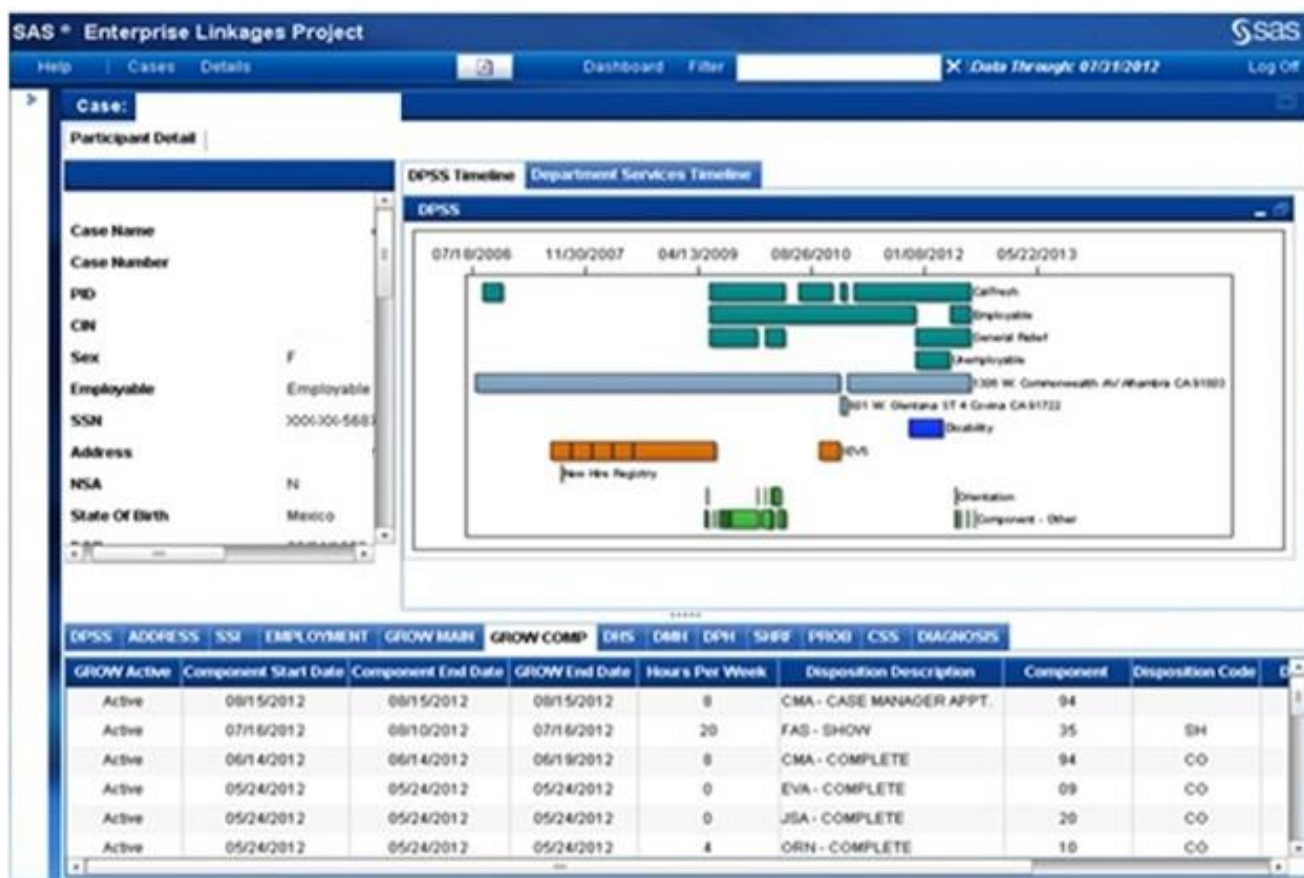


Figure A-4- The ELP User Interface DPSS Timeline

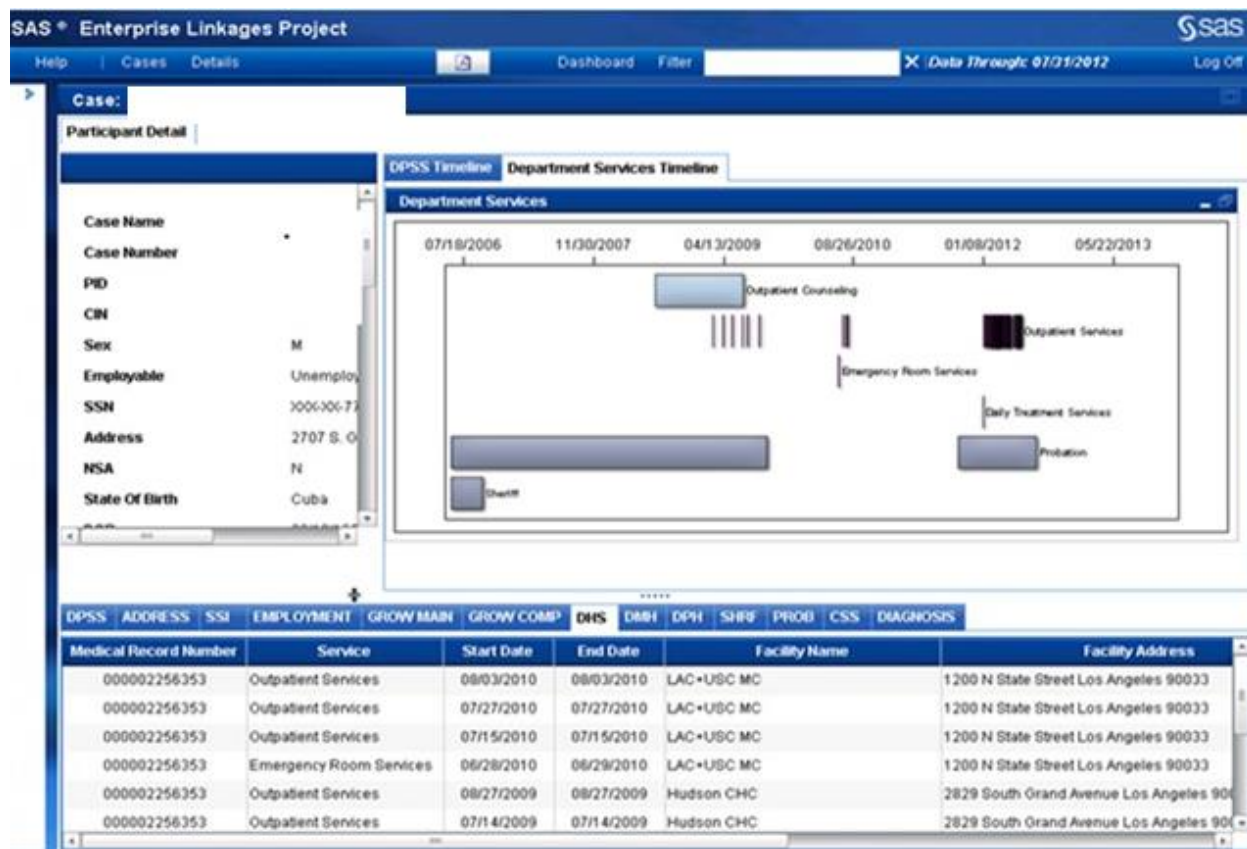


Figure A-5- The ELP User Interface Other Department Services Timeline

Appendix 2 – Resumes

Resumes are provided, beginning on the following page.

CURRICULUM VITAE

MANUEL MORENO, PHD PUBLIC POLICY ANALYTICS, LLC

2118 Wilshire Blvd. # 757, Santa Monica, California 90403
[REDACTED] ManuelMoreno@PublicPolicyAnalytics.org

SUMMARY OF EXPERIENCE

Over twenty-nine years of professional experience implementing large-scale information technology solutions for government agencies, conducting evaluations of large scale-government programs, cost effectiveness studies of public programs, research studies to provide policy makers, administrators and elected officials with evidence-based information, conducting statistical studies, conducting needs assessments, developing Geographic Information Systems, working with demographic and Census data, working effectively with public officials, County administrators, foundations, universities and State and Federal government agencies, demonstrated leadership to introduce state of the art information technology systems to support government programs and policies, demonstrated ability to manage successfully large-scale projects and delivering timely results. Over twenty-nine years of experience with SAS software to implement large-scale computer information solutions to provide decision support systems for policy makers and using analytics to improve performance in government agencies.

PROFESSIONAL EXPERIENCE

2012-Present – CEO, Public Policy Analytics

Public Policy Analytics, LLC provides consulting services in advanced analytics, data mining, integrating information technologies, fraud detection solutions, and program evaluation to help government organizations deliver optimal and cost efficient services and manage risk.

2000–2012- Director of Research, Chief Executive Office, Los Angeles County;

Directed public policy research, implemented integrated data systems, data mining and projects using predictive analytics to support local government public programs and policies.

Planned and directed outcome evaluation research and cost effectiveness studies of public programs and planned and supervised the work of professional staff and consultants working on policy research and developing information technology projects using advanced analytics.

Conducted a series of nationally recognized studies on the outcomes and cost effectiveness of social programs for the Los Angeles County Board of Supervisors.

Directed the implementation of the Enterprise Linkages Project (ELP), an analytical data warehouse which integrated medical, health, social and law enforcement services data across multiple County departments. ELP was designed to provide targeted case management services for county residents receiving public services and is also used to conduct outcome evaluation studies and cost-benefit analysis of public programs. ELP was successfully implements in June of 2012 .

Participated in the Intelligence for Social Policy (ISP) University of Pennsylvania project, an Initiative funded by the MacArthur Foundation to build a national network of government and academic institutions to integrate data systems to support policy research and cost benefit analysis.

Directed the implementation of the Data Mining System using SAS Enterprise Miner, SAS BI, SAS Social Network Analysis and SAS predictive analytics to detect and prevent fraud in social services programs provided to Los Angeles County residents.

Implemented the Adult Linkages Project (ALP) using SAS EDI and SAS DataFlux. ALP demonstrated the feasibility of integrating inter-departmental data on indigent adults. Published a major public policy report on the complex patterns of service utilization and the cost of delivering public services to indigent adults.

Completed a successful proof of concept for to demonstrate the feasibility of implementing SAS data mining tools for preventing and detecting fraud in the County's social services programs.

1988-2000 - Information Systems Specialist, Urban Research Division, Chief Administrative Office

Directed, planned and supervised the work of professional staff and research consultants. Directed and conducted research studies of government programs and conducted legislative analysis to support policy-related research. Provided statistical and demographic research and implemented information technology systems for the Juror Services Division of Superior Court. Made policy recommendations to enhance public programs based on evaluations of social programs. Developed an automated system to implement major changes in the selection and allocation of jurors for Superior Court, and provided extensive consulting services in the preparation of pre-trial statistics for the O.J. Simpson trial. Performed geocoding and data integration applications using record linkage software and developed applications using Geographic Information Systems.

Conducted a ground breaking cost benefit study on the economic and fiscal impact of immigrants on County services.

Directed a nationally recognized study on the fiscal impact of immigration in Los Angeles County, directed a Board-mandated study on the demographic characteristics and the health insurance coverage for the population served by the Department of Health Services. Participated in a study of accountability of municipal service delivery in unincorporated areas for the Citizen's Economy and Efficiency Commission.

Conducted several studies of the demographic representativeness of the jury selection system and implemented computer systems to select and allocate jurors for Superior Court. Implemented a new random number generator algorithm in UNIX to select and allocate jurors.

Conducted an evaluation of the administration of psychotropic drugs to juvenile wards and dependent children for the Ad Hoc Committee of Juvenile Court on Psychotropic Drugs chaired by judge Paul Boland. Directed and supervised the preparation of demographic statistics for Los Angeles county. Developed and implemented an ORACLE system to track medically indigent persons for the Department of Health Services. Developed GIS applications for Superior Court, the Department of Health Services and the Sheriff.

2000-2004 - Instructor, Humanities and Social Sciences Program, UCLA, Extension.

1997-2000 - Adjunct, Department of Sociology, California State University, Fullerton.

1983-1988 - Senior Analyst, Urban Research, Internal Services Department.

Prepared urban research related studies and demographic analysis for several County departments. Represented the Internal Services Department in a multi-department Application Transfer Study that resulted in the formation of the Los Angeles County Geographic Information Systems Advisory Body. Developed statistical programs in the SAS language to prepare comprehensive reports from the 1980 census for several county departments. Developed GIS applications to conduct studies of government services. Provided extensive support to Superior Court to match files to construct juror master files using ADMATCH and UNIMATCH. Provided statistical and demographic support to assist Superior Court in the preparation of jury challenges. Developed and implemented a series of simulation models to determine

the optimal method to allocate jurors to petit trials. Worked with a team of professionals that included the Director of Juror Services, RAND statistical consultants and the National Center for State Courts. Based on an empirical and statistical validation of several juror allocation models the bullseye method of allocating jurors was selected as the method of choice to allocate jurors to petit trials.

1979-1982 - Research Assistant-Teaching Associate, Department of Sociology, School of Architecture and Urban Planning and Latin American Studies Center, University of California, Los Angeles.

Compiled and analyzed national statistics to produce the UCLA Statistical Abstract of Latin America. Produced data analysis chapters on Latin American economic development and developed computer programs in SAS to produce statistics and computer graphics/

EDUCATION

Ph.D. Sociology, University of California, Los Angeles, 1997. Dissertation: The Economic and Demographic Effects of Immigration in Los Angeles County: A Sociological and Public Policy Analysis

M.A. Sociology, University of California, Los Angeles, 1976

B.A. Sociology, California State University, Northridge, 1974

AWARDS

Recipient of the Computerworld Award as a 100 Premier IT Leader in 2010

Recipient of the 2012 Computerworld Laureate Honors for developing a data mining system for detecting and preventing fraud in Los Angeles County public assistance program.

2010 Award from the Los Angeles County Board of Supervisors for introducing data mining technology for fraud prevention in the County's public Assistance programs.

2009 National Association of Counties Achievement Award for the Adult Linkages Project.

SELECTED PRESENTATIONS AND PUBLICATIONS

Using Data Integrated Systems for Making Data-Driven Policy and Program Decisions: in Los Angeles County: The Case of the General Relief Housing Subsidy Program. Presentation Prepared for the Collaborative Forum Monthly Meeting Panel Discussion. Innovative Data Management: Harnessing Data to Develop and Demonstrate Effective Homelessness Intervention. The White House, Washington, DC, August 2, 2012

Los Angeles County's Enterprise Linkages Project: An example of the use of integrated data systems in making data-driven policy program decisions (with Byrne, Metraux, Culhane, Toros and Stevens). California Journal of Politics and Policy, June 2012.

Project 50: The Cost Effectiveness of the Permanent Housing Supportive Model in the Skid Row Section of Los Angeles County, Principal Investigator, June 2012

Young Adult Outcomes of Youth Exiting Dependent or Delinquent Care in Los Angeles County (with Dennis Culhane, Steve Metraux and Halil Toros, November 2011, research supported by the Hilton Foundation.

Combating Fraud in public assistance programs in Los Angeles with the SAS Fraud Framework. SAS

Global Forum Executive Conference, Las Vegas, April 2011.

LA County closes on Fraud rings with the SAS Fraud Framework, Customer Success Story Video presentation, 2010. http://www.sas.com/success/lacounty_fraud.html

LA County Improves Indigent Adult Services; Support Policy Changes and Protects Privacy with SAS, Customer Success Story, 2010.

http://www.sas.com/success/lacounty_analytics.html

Using Advanced Analytics to Detect Child Care Fraud. The Premier Business Leadership Series, October 2010, Las Vegas, Nevada

Opening Session Presentation on data mining and fraud detection in Los Angeles with Dr. Jim Goodnight and John Brocklebank, SAS Global Forum, Seattle, Washington, April 2010.

<http://www.sas.com/apps/webnet/remote-event-viewer/RemoteEventViewer.html?c=5CD408C4-CA8A-42E1-9CD0-6C7047534503>

Evidence Based Governance in Los Angeles County: Using Advanced Analytics to Detect Child Care Fraud, SAS Global Forum, Executive Conference, Seattle, April 2010.

Data Integration and Evidence Based Policy Analysis in Los Angeles. Prepared for the Intelligence for Social Policy Network Meeting, June 14-15, 2010, University of Pennsylvania.

Cost Avoidance Yielded Through Participation in the Long Beach Homeless Veterans Initiative, Principal Investigator, March 2010.

The General Relief Housing Subsidy and Case Management Pilot Project: An Evaluation of Participant Outcomes and Cost Savings, Principal Investigator, September 2009.

Sanctioned Participants and the Challenge of Meeting Welfare-to-Work requirements in the Era of TANF Reauthorization, October 2009.

Examining the Cost Effectiveness of Los Angeles County's Homeless Prevention Initiative: The Case of the General Relief Housing Subsidy and Case Management Pilot Project, June 2008, (with H. Toros and Max Stevens).

Statistical Randomization of Qualified Jurors in Los Angeles County Juror Allocation System. (with Duc Doan). A report prepared for Los Angeles County, Superior Court. Internal Services Department, Advanced Systems, Urban Research, 1994.

Impact of Undocumented Persons and Other Immigrants on Costs, Revenues and Services in Los Angeles County: A Report Prepared for Los Angeles County Board of Supervisors, PI, Internal Services Department, and November 1992.

Demographic Representativeness in Los Angeles County Jury System, prepared for presentation at the Annual Conference of the Urban Regional Information Systems in Edmonton, Alberta, Canada, August 1990.

Controversy Concerning Trauma Hospital Locations in Los Angeles County, presented at the 23rd Annual Conference of the Urban Regional Information Systems Association, Ottawa, Ontario, July 28 - August 1, 1985.

Latin American Food Production and Population in the Era of Land Reform Since the 1950's. (co-author with James Wilkie) In *Foods, Politics and Society in Latin America*, John C. Super and Thomas C. Wright (eds.) Lincoln: University of Nebraska Press, 1985.

New Research on Food Production in Latin America Since 1952. In *Statistical Abstract of Latin America*, 1984, vol. 23 edited by James Wilkie and Stephen Haber (Los Angeles: UCLA Latin American Center Publications).

Restructuring the Jury Allocation Process for the Los Angeles County Jury Management System. (with Wayne Bannister and John Rolph) in *The Changing Role of Computers in Public Agencies*, Rolf R. Schmitt and Haran J. Smolin (eds.). Papers from the Regional Information Systems Association Annual Conference, Washington, D.C, 1984.

Housing and Shelter in Latin America, 1965-1980. In *Statistical Abstract of Latin America*, 1982, vol. 22 edited by James Wilkie and Stephen Haber (Los Angeles: UCLA Latin American Center Publications).

Latin American Fisheries: Natural Resources and Expanded Jurisdiction, 1938-1978." In *Statistical Abstract of Latin America*, 1981, vol. 21 edited by James Wilkie and Stephen Haber (Los Angeles: UCLA Latin American Center Publications).

HALIL TOROS

2118 Wilshire Blvd. #956, Santa Monica, CA 90403

Telephone: (310) 384 7661, E-Mail: haliltoros@publicsectoranalytics.org

PROFESSIONAL PROFILE

- Analyst with over 15 years of increasingly responsible experience who developed deep expertise in studying complex public policy programs including programs targeting welfare families and children, homeless population and applying scientific research and analysis methods and techniques to develop, monitor and report performance measures and outcomes and prepare and present reports to make policy recommendations.
- Creative thinker and problem-solver with strong analytical skills and research background and 15+ years of experience in supporting several government departments in translating complex customer requirements and business problems and designing, developing and implementing custom-based innovative solutions.
- Analyst with over 20 years of experience in building analytical models using advanced statistical techniques to solve problems in human services offered by different public agencies.
- Expertise and over 25 years of experience using SAS in analyzing large-scale government and private data systems to support public programs and policies.
- Over 20 years experience with manipulating complex data sources and file types and applying data cleaning and data quality techniques for error resolution, identifying trends and patterns in data, data profiling, fuzzy matching and entity resolution using SAS and Dataflux technologies.
- Over 20 years experience using SAS to operationalize multiple big data systems to prepare data to be used with relevant analytical and statistical methods to evaluate and solve client problems
- Over 10 years of experience in providing technology and solution best practice and enablement developing innovative SAS solutions for public sector problems , and maintaining extensive knowledge of solutions, technologies, methodologies and procedures
- Over 5 years of experience in developing fraud management solutions using SAS tools such as Fraud Framework and Enterprise Miner, including preparing business requirements, developing proof of concept, demonstrating ROI, developing preventive and detection strategies, evaluating predictive models and maintain fraud management systems.
- Effective and personable team player with strong interpersonal skills and demonstrated ability to establish partnering with other public agencies, private sector and community groups on matters related to public services delivered to target populations.
- Visionary and global thinker who continuously develops his skills through intensive research and training and has a long teaching background that makes him adept at training, developing and counseling team members and clients.

AREAS OF STRENGTH

- Predictive Analytics
- Outcome Analytics
- Evaluation Research
- Data Quality
- Public Sector Experience
- Business Intelligence
- Statistical Analysis
- Policy Analysis
- Academic Background

HIGHLIGHTS OF PROFESSIONAL EXPERIENCE

Chief Analytics Officer, Public Policy Analytics, March 2013 to Present

➤ **Analytic Projects**

- Provides consulting services in data integrating technologies, analytics and data mining, data quality and master data management, economic analysis, policy and program evaluation and fraud detection solutions.
- Working on a Medicaid/Medicare fraud solution to apply predictive models in identifying fraud
- Worked on a warranty fraud solution with SAS Institute to develop dealer models applying statistical methods using the SAS platform
- Worked on a data quality solution using SAS tools and Dataflux technology to generate master juror lists for Superior Court, Los Angeles.

Program Specialist IV, County of Los Angeles, Chief Administrative Office, Service Integration Branch, Research and Evaluation, April 2001 to March 2013

➤ **Program Evaluation Projects**

- Worked as a lead analyst in developing research plans, collecting and analyzing welfare data, designing and analyzing survey data, writing and presenting reports and making recommendations for the solution of programmatic problems related to the delivery of welfare services to children and families.
- Designed and evaluated the impact of pilot programs and new policy changes in welfare services by applying complex analytical methods and making recommendations to improve the implementation of programs.
- Delivered excellent customer service for several county departments by providing timely reports and critical information for their needs.
- Established partnerships with other County departments, public and private agencies and community groups.
- Collaborated with Universities and Federal and State agencies on several research projects

➤ **Analytics Projects**

- *Worked with Departments of Public Social Services and Department of Children Services to develop analytical models in predicting outcomes such as the likelihood of SSI approval, the likelihood of finding employment after receiving supportive housing and child abuse risks.*

➤ **Enterprise Linkages Project**

- Worked as the lead technical role in developing this project collaborating with several County departments to capture and present the services received by indigent adults from seven departments over time for planning purposes.
- The project was designed to share data among several departments at this scale for the first time by proposing a solution to overcome data confidentiality issues. The technology component of the project allowed the integration of a data matching application with a business intelligence platform to provide access to valuable information for end-users.
- The project earned the National Association of Counties (NACO) award.

➤ **Data Mining Project for Child Care Fraud**

- Acted as the project technical lead in the development of a data mining solution for child care fraud needed for DPSS. Developed POC with SAS demonstrating that the proposed solution is estimated to save the County millions of dollars.
- Prepared the Statement of Work and Statement of requirements for the RFP opened for a multi-million dollar data mining platform and evaluated the bids presented. Heavily involved in contract negotiations with the vendor.
- Acted as the County technical lead in the implementation of the project that will be later extended to all County programs. Heavily involved in data preparation and model assessment.
- Gave several presentations on the project implementation
- The project earned several awards including the Computerworld Honors Laureate Award

Senior Support Analyst, County of Los Angeles, Chief Administrative Office, Urban Research, June 1994 – December 1999

➤ **Sales Tax Recovery**

- Developed and conducted an application to identify retail companies located in the County but allocated to other jurisdictions by SBE. Then these companies were reallocated to the County and this process yielded over \$10 million dollar of revenue recovery within 2 years. The application involved quarterly processing and geo-coding of the sales tax files and served as an effective tool of revenue recovery.

➤ **Franchise Tax Board Project**

- Developed and conducted a project to process and analyze tax records of eight Southern California Counties. The project aggregated, geo-coded and analyzed more than 12 million State tax records at Sacramento. A forecasting model later used this data.

➤ **MICRS Project**

- Developed and conducted a record linkage application for the Medically Indigent Care and Reporting System (MICRS) which required quarterly processing of more than a million visits to the Los Angeles County health facilities. The application generated unique identifiers to track multiple visits of patients over time.

Support Analyst II, County of Los Angeles, Internal Services Department,
Urban Research, August 1987 – June 1994

➤ ***Juror Allocation Applications***

- Developed and conducted applications to create juror pools for several California and out of California Counties by processing these counties' drivers and voters' files and randomly allocating jurors from master juror pools.

➤ ***Population and Poverty Estimation Project***

- Participated in the development of population and poverty estimation project for Los Angeles County at the census tract level. The project was designed and developed as a menu-driven application to generate intelligent reports.

➤ ***General IT support***

- Provided support to different County departments in data problems and guided them how to use their data more effectively.
- Provided support to different County departments in developing geographical data applications such as geo-coding solutions

Adjunct Professor, University of Southern California, Graduate School of Planning,
Policy and Development, September 2007 – 2013,

Instructor, California State University at Dominguez Hills, Business School,
September 1985 – December 1990

EDUCATION

- **Ph.D.** Political Economy and Public Policy, University of Southern California, Los Angeles, 1991
- **M.A.** Economics, University of Southern California, Los Angeles, 1984
- **B.Sc.** Economics and Statistics, Middle East Technical University Business School, Ankara, Turkey, 1979

SELECTED RECENT PUBLICATIONS

- Thomas Byrne, Stephen Metraux, Manuel Moreno, Dennis P. Culhane, Halil Toros, Max Stevens, Los Angeles County's Enterprise Linkages Project: An Example of the Use of Integrated Data Systems in Making Data-Driven Policy and Program Decisions. California Journal of Politics & Policy, June 2012; 4(2): 95–112
- D. P. Culhane, S. Metreux, S., M. Moreno, M & H. Toros "Young Adult Outcomes Of Youth Exiting Dependent Or Delinquent Care In Los Angeles County", **Hilton Foundation**, November 2011

- M. Moreno, H. Toros, et.al. "An Evaluation of the Utilization and Effectiveness of Four Homeless Assistance Programs for CalWORKs Families" **Los Angeles County**, July 2010
- M. Moreno, H. Toros, et.al. "The General Relief Housing Subsidy and Case Management Pilot Project: An Evaluation of Participant Outcomes and Cost Savings" **Los Angeles County**, August 2009
- M. Moreno, H. Toros, et.al. "Examining the Cost Effectiveness of Los Angeles County's Homeless Prevention Initiative: The Case of the General Relief Housing Subsidy Pilot Project", **Los Angeles County**, June 2008
- M. Moreno, H. Toros, et.al. "Stage 1 Child Care Subsidies for Welfare-to-Work Participants in Los Angeles County: An Analysis of Eligibility and Utilization Patterns", **Los Angeles County**, November 2007
- M. Moreno, H. Toros, et.al. "Sanctioned Participants and the Challenge of Meeting Welfare-to-Work Requirements in the Era of TANF Reauthorization", **Los Angeles County**, October 2006
- M. Moreno, H. Toros, et.al. "Results from the GAIN Sanctions Home Visit Outreach Pilot Project, **Los Angeles County**, May 2006
- M. Moreno, H. Toros, et.al. "The Changing CalWORKs Case-Type Composition in the County of Los Angeles, 2002 to 2005", **Los Angeles County**, April 2006
- M. Moreno, H. Toros, et.al. "Study of Sanctions Among CalWORKs Participants in the County of Los Angeles", **Los Angeles County**, March 2005.
- M. Moreno, H. Toros, et.al. "Employment and Earnings Among CalWORKs Participants in Los Angeles County, 1998 -2001", **Los Angeles County**, April 2003.

January 28, 2013

CURRICULUM VITAE

Dennis Patrick Culhane

Office: University of Pennsylvania
3701 Locust Walk, C18
Philadelphia, PA 19104-6214

Education: 1985 - 1990 Ph.D., Boston College (Social Psychology)
Dissertation: *On Becoming Homeless: The Structural and Experiential
Dynamics of Residential Instability*
1981 - 1985 B.A., St. Bonaventure University (Psychology) *Summa Cum Laude*

Faculty and Administrative Appointments:

2009 – pres. Director of Research, National Center on Homelessness among Veterans, the United States
Department of Veterans' Affairs
2007 – pres. Professor of Policy Research and Evaluation, School of Education, University of
Pennsylvania
2002 - pres. Professor of Social Policy, School of Social Policy and Practice, University of Pennsylvania
2002 – pres. Professor of Psychology in Psychiatry, School of Medicine, University of Pennsylvania
1998 - pres. Faculty Co-Director, Cartographic Modeling Laboratory, University of Pennsylvania
2008 – pres. Senior Fellow, Center for Public Health Initiatives, University of Pennsylvania
1997 - pres. Research Associate, Center for Population Studies, School of Arts and Sciences, University of
Pennsylvania
1993 - pres. Senior Fellow, Leonard Davis Institute of Health Economics, University of Pennsylvania
1996 - 2002 Associate Professor of Psychology in Psychiatry, School of Medicine, University of
Pennsylvania
1995 - 2002 Associate Professor of Social Welfare Policy, School of Social Work, University of
Pennsylvania
1990 - 1995 Research Assistant Professor of Psychology in Psychiatry,
School of Medicine, University of Pennsylvania
1988 - 1990 Instructor in Psychology, School of Arts and Sciences, Boston College

Awards and Honors:

2009 Michael B. Katz Award for Excellence in Teaching, Urban Studies, University of Pennsylvania
2006 National Partner Award, United States Interagency Council on Homelessness
2005 America's Best and Brightest honoree, *Esquire*
2003 The John W. Macy Award for Individual Leadership (awarded by the National Alliance to End
Homelessness)
1991 The Dissertation Award of the Society for Community Research and Action (Division 27 of the
American Psychological Association)
1985 The Award for Academic Excellence, First in Graduating Class, St. Bonaventure University

1984 Pi Epsilon Sigma National Honor Society

Membership in Professional and Scientific Societies:

American Psychological Association, Division of Community Psychology (1989 - 1995)
American Orthopsychiatric Association (1989 - 2000)
Society for the Psychological Study of Social Issues (1990 - 1995)
Society for the Study of Social Problems (1991 - 1995)
Association for Health Services Research (1991 - 1998)
American Public Health Association (1991 - 2001)

Editorial Positions:

2013 - pres. Member, Editorial Board, *Housing Studies*
2011 - pres. Member, Editorial Board, *Social Service Review*
2009 - pres. Member, Editorial Board, *The European Journal on Homelessness*
2006 - pres. Member, Editorial Board, *Cityscape*
1997 - 2012 Member, Editorial Board, *Housing Policy Debate*
1988 - 1990 Student Editor, *American Journal of Community Psychology*

Funded Research:

2012 – 2015 Actionable Intelligence for Social Policy: Advancing the Science of Data Integration to Support Social Policy Reform. The John D. and Catherine T. MacArthur Foundation.
2012 – 2013 The Impact of Adverse Child Events on Adult Homelessness among Veterans and Nonveterans. The Bill and Melinda Gates Foundation.
2012 – 2013 Adult Outcomes of Youth Exiting Dependent and Delinquent Care in Los Angeles County: Followup Analyses. The Conrad N. Hilton Foundation.
2012 - 2015 The Impact of Assisted Housing on Educational Well-Being. United States Department of Housing and Urban Development (PI), the John D. and Catherine T. MacArthur Foundation, and the Bill and Melinda Gates Foundation.
2010 – 2013 Evaluation of the Rapid Re-housing for Families Demonstration Program. United States Department of Housing and Urban Development (PI, in collaboration with Abt Associates).
2009 – 2014 The National Center for Homelessness among Veterans. United States Department of Veterans Affairs (PI).
2009 – 2012 Intelligence for Social Policy: Establishing a National Network of Integrated Data Systems in Support of Systems Change and Policy Reform (PI). The John D. and Catherine T. MacArthur Foundation.
2009 – 2012 Establishing an Integrated Database Policy Analysis Capacity for the City of Philadelphia (Co-PI, with John Fantuzzo). The William Penn Foundation.
2009 – 2012 A Study of Multi-system Youth in Philadelphia: Determinants and Patterns of Services Use (PI). The Stoneleigh Foundation.
2008 – 2012 A RCT of Housing and Services Interventions for Homeless Families (co-I). United States Department of Housing and Urban Development.
2002 – 2012 The Annual Homelessness Assessment Report to Congress (PI, with Jill Khadduri, Abt

- Associates). The United States Department of Housing and Urban Development.
- 2009 – 2011 A Study of Youth Exiters from Dependent and Delinquent Care in Los Angeles County (PI). The Conrad Hilton Foundation.
- 2008 – 2011 A Study of Community-based Homelessness Prevention in New York City (co-I). The City of New York.
- 2009 Modeling the Impact of Supportive Housing Interventions on Chronic Homelessness and Patterns of Services Use in Palm Beach County, Florida (PI). Palm Beach County.
- 2009 Modeling the Impact of Supportive Housing Interventions on Chronic Homelessness and Patterns of Services Use in Fresno, California (PI). City of Fresno.
- 2009 A Times Series Model of Rates of Public Shelter Admissions in New York City (PI). The City of New York.
- 2008 – 2009 Patterns of Health, Justice and Homeless Services Use among Adult Recipients of General Relief (co-PI). The County of Los Angeles, Office of the Chief Executive Officer.
- 2007 – 2009 The Efficacy of Relocation and Transitional Assistance versus Standard Shelter for Homeless Families with Barriers to Housing Stability (PI). City of Philadelphia.
- 2008 The Use of Integrated Administrative Data Systems for Policy Analysis and Research: A Study of Current Practice in the Field (PI). John D. and Catherine T. MacArthur Foundation
- 2007- 2008 Modeling Supportive Housing Reimbursement for Multiple Populations with Homelessness Histories in New York City (PI). United Hospital Fund of New York.
- 2006 – 2007 An Evaluation of the “Rebuilding Lives” Strategy and Homelessness Systems Reforms of Columbus Ohio. Columbus Emergency Shelter Board. (Co-PI, with Stephen Metraux)
- 2005 – 2007 A Typology of Family Homelessness and Associated Service Utilization Patterns and Costs. The Conrad Hilton Foundation. (PI)
- 2005 – 2006 Out of School Youth Assessment and Strategic Planning Research with Philadelphia Youth Transition Funders Group. Wm Penn Foundation. (Co- Investigator)
- 2004 – 2005 Community based Participatory Prevention Research in Obesity. Centers for Disease Control and Prevention (Co-investigator).
- 2003 – 2005 Homicides and Suicides and the Relationship to Alcohol Distribution Outlets (Co-Investigator). National Institutes of Health (Principal Investigator, Charles Branas).
- 2003 – 2007 EXPORT: Health Disparities and Obesity. National Institutes of Health (GIS Core Leader and Co-Investigator).
- 1998 – 2009 Philadelphia Neighborhood Information System: A Web-based Geographic Information System [GIS] for Community Planning and Development (Principal Investigator). The City of Philadelphia, the Pew Charitable Trusts, the William Penn Foundation, and the University of Pennsylvania, in cooperation with the Office of Housing and Community Development, the Mayor's Office of Information Services, the Department of Licenses and Inspections, the Board of Revision and Taxes, the Water Department, the Philadelphia Gas Works, the Mayor's Office of Policy and Planning, the Department of Revenue, and the City Planning Commission.
- 2001 – 2009 The Kids Integrated Database Initiative (co-Principal Investigator with John Fantuzzo and Trevor Hadley). The William Penn Foundation, in cooperation with the City of Philadelphia, Department of Human Services, Department of Public Health, and the Office of Emergency Shelter and Services, and the School District of Philadelphia.
- 2003 – 2004 The Intersection of the Child Welfare and Public Shelter Systems in Philadelphia (Co-

- Principal Investigator, with Min Park). The City of Philadelphia, Department of Human Services.
- 2001 – 2003 The Intersection of the Child Welfare and Public Shelter Systems in New York City (Principal Investigator). The City of New York, Administration for Children Services.
- 2003 – 2004 The AIDS Housing Needs Assessment for New York State (Principal Investigator, with Ginny Shubert). New York State Department of Health, with Hudson Planning Group.
- 2001 – 2003 The AIDS Housing Needs Assessment for the New York Metropolitan Area (Principal Investigator, with Ginny Shubert). The City of New York, Mayor's Office of AIDS Policy Coordination, with Hudson Planning Group.
- 2001 A Feasibility Study for the Evaluation of Supportive Housing in Illinois (co-Principal Investigator). The State of Illinois Department of Human Services, and the Coalition of Supportive Housing Providers in Illinois.
- 2002 – 2004 SUMS Replication: Columbus-Franklin County, OH. (Principal Investigator). Community Research Partners.
- 2001 – 2002 The Children and Families Services Utilization Monitoring System (SUMS): A Web-based Geographic Information System for the Analysis of Children's Needs (Principal Investigator). The Children's Services Council of Palm Beach County, Florida.
- 2001 – 2002 A Study of Housing Affordability in Philadelphia (co-Principal Investigator, with Amy Hillier). Coalition for Affordable Housing and the Women's Community Revitalization Project.
- 2001 The Impact of Institutional Discharges on Shelter Admissions (Principal Investigator). The Melville Charitable Trusts.
- 2000 – 2001 Impacts of Welfare Reform on Emergency Food and Shelter Utilization: A Cross-Site Analysis in Four US Cities (Principal Investigator). US Department of Health and Human Services (HHS), Office of the Assistant Secretary for Planning and Evaluation (ASPE), and the Center for Mental Health Services/SAMHSA (CMHS).
- 2000 – 2002 The Prevalence of Homelessness in the United States: Analysis of HMIS Data in 15 Jurisdictions (Principal Investigator). US Department of Housing and Urban Development, with the Aspen System Corporation.
- 1999 – 2001 The Children and Families Services Utilization Monitoring System (SUMS): A web-based Geographic Information System for the Analysis of Children's Needs (Principal Investigator). City of Philadelphia's Children and Families Cabinet, Office of Family Service System Reform.
- 1998 – 2001 The Impact of Welfare Reform on Homelessness and Residents of Federally Assisted Housing Programs (Principal Investigator). US Department of Housing and Urban Development.
- 1998 – 2001 Developing a Geographic Information System for the Tracking and Analysis of Recovered Firearms (Co-Principal Investigator, with Neil Weiner). Funded by the Pennsylvania Commission on Crime and Delinquency, in cooperation with the Federal Bureau of Alcohol, Tobacco and Firearms, and the Philadelphia Police Department.
- 1998 - 2001 The Public Costs of Homelessness versus Supported Housing in New York City: Assessing the Differential Impact on NYS Medicaid-funded Services, Veterans Administration Programs, the Health and Hospitals Corporation, New York State Psychiatric Hospitals, and the New York State Dept. of Corrections. (Principal Investigator). Sponsored by the Corporation for Supportive Housing, with the Hilton Foundation, the Fannie Mae Foundation, and the United Hospital Fund.

- 1998 – 1999 The National Homeless MIS Data Users Group (Coordinator, Conference Series) US DHHS, SAMHSA, Center for Mental Health Services, and US DHHS Office of the Assistant Secretary for Planning and Evaluation.
- 1998– 1999 Philadelphia Snapshot: A Housing and Vacant Land Inventory (Co-Principal Investigator). In collaboration with the Mayor’s Office of Housing and Community Development (J. Kromer), and Public/Private Ventures (M. Hughes), funded by the William Penn Foundation.
- 1998 – 1999 West Philadelphia Community Development Information System (Principal Investigator). Fannie Mae and the University of Pennsylvania.
- 1998 The Welfare Reform Evaluation Planning Grant (Principal Investigator). The Private Industry Council and Mayor’s Office of Policy and Planning.
- 1998 – 1999 An Evaluation of the Homelessness Prevention Program of the City of Philadelphia (Co-Investigator with Irene Wong). City of Philadelphia, Mayor’s Office of Housing and Community Development.
- 1997 – 1998 The Heterogeneous Effects of Federally Assisted Housing Programs on Neighborhood Quality and Property Values (Co-Principal Investigator with Chang-Moo Lee and Susan Wachter). US Department of Housing and Urban Development.
- 1997 – 1999 The Housing Vacancy Prevention Project (Principal Investigator). Boettner Center for Financial Gerontology.
- 1997 Where the Homeless Come from in Washington, DC: A Planning Study for the Development of Homelessness Prevention Programs (Principal Investigator). The Fannie Mae Foundation.
- 1994 – 1997 Research to Support the Development of Homelessness Prevention Programming in New York City: I. the Geographic Indicators for Homelessness, and II. Shelter Stay Patterns in NYC (Principal Investigator). Edna McConnell Clark Foundation in cooperation with the New York City Department of Housing Preservation and Development, and the New York City Department of Homeless Services.
- 1995 – 1998 Building a National Data Capacity for Homelessness Program Planning and Policy Development: The Automated National Client-specific Homeless Services Recording System (the ANCHoR System) (Principal Investigator). US Department of Housing and Urban Development, Office of Policy Development and Research; US Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation; the Fannie Mae Foundation; and PRWT Services, Inc., in collaboration with the Cities of Boston, New York, Detroit, Chicago, Miami, Baltimore, Cleveland, Louisville, Fort Worth, New Orleans, Richmond, Milwaukee, Anchorage, Savannah, and Camden.
- 1994 – 1998 Developing an Early Warning Information System for Distressed Housing in New York City (co-Principal Investigator with Susan Wachter and Michael Schill). Edna McConnell Clark Foundation, and in cooperation with the NYC Department of Housing Preservation and Development, the NYC Department of Finance, the NYC Department of Buildings, and the New York City Department of City Planning.
- 1996- 1997 Shelter System Utilization Patterns Research (Principal Investigator). The City of New York, Department of Homeless Services.
- 1994 – 1997 Developing a Decision Support GIS Tool for CBOs Seeking Fair Access to Mortgage Credit (Principal Investigator). US Department of Housing and Urban Development, Office of Policy Development and Research.

- 1996 – 1997 An Evaluation of the City of Philadelphia’s Homelessness Prevention Pilot Project (Principal Investigator). City of Philadelphia and the Energy Coordinating Agency.
- 1995 – 1996 AIDS Housing Needs Assessment Consumer Survey for the Philadelphia Metropolitan Area (Principal Investigator). City of Philadelphia, Office of Housing and Community Development.
- 1995 - 1996 The Utilization of Public Hospitals by Homeless Persons in New York City (Principal Investigator). United Hospital Fund of New York City, in cooperation with the Health and Hospitals Corporation.
- 1994 – 1995 A Longitudinal Study of the Treated Prevalence of Mental Disorders among Public Shelter Users in Philadelphia (Principal Investigator). US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, The Center for Mental Health Services, in cooperation with the City of Philadelphia Office of Mental Health.
- 1994 The Relationship between Utility Terminations and the Onset of Homelessness in Philadelphia (Principal Investigator). The Office of Legislative Affairs, the City Council, City of Philadelphia, in cooperation with the Philadelphia Gas Works, the Philadelphia Water Revenue Department, and the Philadelphia Electric Company.
- 1993 – 1994 Applying Integrated Database Research to the Study of AIDS and Mental Illness among the Homeless of Philadelphia and New York City (Principal Investigator). The Ittleson Foundation.
- 1993 Public Shelter Admission Rates in Philadelphia and New York City (Principal Investigator). The Fannie Mae Office of Housing Policy Research.
- 1993 – 1996 National Center for Vocational Rehabilitation Research and Training (Co-Investigator). National Institute for Disability and Rehabilitation Research.
- 1993 – 1996 The Effects of the Philadelphia State Hospital Closure (Co-Investigator). Pew Charitable Trusts.
- 1988 – 1989 Dissertation Research Grant (Principal Investigator). Boston College.
- 1988 Comparative Research in Income Inequality, Luxemburg Income Study. (Research Fellowship). Ford Foundation.
- 1988 Homelessness among Single Adults in Philadelphia: An Ethnographic Study (Principal Investigator). Samuel S. Fels Foundation.
- 1987 International Symposium on Homelessness and Affordable Housing, University of Hamburg, Federal Republic of Germany (Travel grant and scholarship). Volkswagen Foundation.

Academic and Public Service Activities:

- 2012 – pres. Chair, Student Policy and Procedures Committee, School of Social Policy and Practice
- 2011 – pres. Member of the Advisory Board, The Barra Foundation.
- 2007 – pres. Co-Chair, Research Advisory Board, National Alliance to End Homelessness
- 2004 – pres. Executive Committee of the Penn Urban Research Institute
- 2001 - pres. Chair, Division of Public Safety Advisory Board, UPenn
- 1998 – pres. Board member, Massachusetts Housing and Shelter Alliance
- 1991 – pres. Volunteer, Penn Relays, University of Pennsylvania Athletic Communications
- 2009 – 2011 Member of the Advisory Board, Wayne State University, College of Nursing, Center for Health Research

2009 – 2011 Chair, Policy Sequence, School of Social Policy and Practice
 2003 – 2008 Consultant, US Interagency Council on Homelessness, White House Domestic Policy Council
 2006 – 2008 Admissions Committee, Masters in Public Health Program
 2001 – 2007 Fannie Mae Northeastern Regional Advisory Board
 2004 - 2006 Faculty Senate Executive Committee
 2000 – 2006 President, University City Swim Club
 2003 - 2004 Personnel Committee, School of Social Work
 2003 – 2004 City of New York 10-Year Plan to End Chronic Homelessness:
 Strategic Planning Committee on Outreach, Shelter and Permanency
 2003 - 2004 Chair, *Ad Hoc* Committee on Racial Profiling
 2002 – 2004 Chair, Pluralism Committee, University Council
 2001 – 2002 Chair, University Strategic Planning Committee on Urban and Community Issues
 1999 – 2000 Division of Public Safety Advisory Board, Member
 1998 – 2000 Curriculum Committee, School of Social Work
 1998 – 2000 Chair, Policy Sequence Committee, School of Social Work
 1997 – 2000 Vacancy Prevention Task Force, City of Philadelphia
 1997 - 2000 Chair, Open Expression Committee, University of Pennsylvania
 1997 - 2000 Member, Board of Directors, Garden Court Community Association
 1991 - 2000 Committee for the Protection of Human Subjects, City of Philadelphia, Dept. of Public Health
 1997 - 1999 Grievance Committee, School of Social Work
 1995 - 1996 Personnel Committee, School of Social Work
 1995 - 1998 Steering Committee, National Resource Center on Homelessness and Mental Illness
 1995 - 1998 Homelessness Prevention Task Force, City of Philadelphia
 1991 - 1998 Statistical support, University of Pennsylvania, Office of Sports Information (Football)
 1994 - 1997 Urban Studies Graduate Certificate Program Steering Committee
 1991 - 1992 Board Member, The Lewin Society for the Advancement of Field Theory
 1989 - 1990 Human Subjects Committee, Boston College
 1988 - 1990 Graduate Program Committee, Psychology Department, Boston College

Invited Lectures, Legislative Testimony and Executive Branch Briefings (selected):

December 11, 2012. Briefing. Progress in Addressing Veteran Homelessness. The United States Interagency Council on Homelessness. Washington, DC.

December 4, 2012. Integrated Data Systems and their Utility for Policy Research and Evaluation. Federal Committee on Statistical Methodology, Statistical Policy Seminar. Washington, DC.

September 28, 2012. Housing First! And the Homelessness Prevention Framework in the US. Town Council, Barcelona, Spain.

September 26, 2012. Homelessness Prevention in the US Context. Focus Ireland Conference. Dublin, Ireland.

September 21, 2012. Homelessness Prevention in the US Context. Utrecht, Netherlands.

April 19, 2012. The Dynamics of Homelessness and the Implications for Public Policy in the US. The Australian Housing and Urban Research Institute. Melbourne, Australia.

April 13, 2012. The Policy Uses of Integrated Administrative Data Systems. New South Wales, Department of Treasury. Sydney, Australia.

February 10, 2012. The Dynamics of Homelessness and the Implications for Public Policy in the US. Crisis Convening. London, England.

February 9, 2012. The Dynamics of Homelessness and the Implications for Public Policy in the US. Cardiff University. Cardiff, Wales.

February 7, 2012. The Dynamics of Homelessness and the Implications for Public Policy in the US. Shelter Scotland Homelessness Conference. Edinburgh, Scotland.

November 1, 2011. Integrating Data across Government Services to Improve Quality, Efficiency and Outcomes. United States Department of Justice. Washington, DC.

June 28, 2011. Housing First! An Evidence-based Social Innovation to Address Long-term Homelessness. European Commission, the Committee of the Regions, the European Economic and Social Committee, and FEANTSA. Brussels, BE.

June 27, 2011. Housing First! An Evidence-based Social Innovation to Address Long-term Homelessness. European Commission Seminar. Brussels, BE.

June 16, 2011. Housing First! An Evidence-based Social Innovation to Address Long-term Homelessness. HOPE in Stations: Orientation Committee on Housing Led Policies in Europe. Rome, IT

January 12, 2011. A Prevention-Centered Homelessness Assistance System: A Paradigm Shift? John F. Kennedy School of Government, Harvard University. Cambridge, MA.

December 14, 2010. A Prevention-Centered Homelessness Assistance System: A Paradigm Shift? Rutgers University.

December 8, 2010. Using Data to Inform Systems Change in VA Homeless Programs. US Department of Veterans' Affairs Homelessness Summit. Washington, DC.

September 27, 2010. Homelessness in the United States: 2009 AHAR. US Department of Housing and Urban Development Homelessness Conference. Atlanta, GA.

April 16, 2010. A Prevention Paradigm for Homelessness Policy. University of Nebraska: Omaha.

March 1, 2010. Briefing on homelessness policy directions. The Domestic Policy Council. The White House, Washington, DC.

February 9, 2010. Invited testimony. State of California Assembly Committee on Housing and Community Development. Sacramento, CA.

February 4, 2010. Briefing on homelessness prevention paradigm. City Council of the City of New York. New York, NY.

January 29, 2010. Grand Rounds. Homelessness Research and Policy Reform Strategies. University of Vermont, Department of Psychiatry. Burlington, VT.

December 10, 2009. The Dynamics of Homelessness and the Evolution of US Social Policy. Trinity College, Dublin, Ireland.

November 3, 2009. Prevention-Centered Approach to Homelessness: A Paradigm Shift? National Meeting of the United States Department of Veterans Affairs on Homelessness. Washington, DC.

October 21, 2009. Challenges and Opportunities for the Future of Homelessness Assistance in Philadelphia. Grand Rounds, City of Philadelphia, Office of Behavioral Health Services.

September 3, 2009. A Pittsburgh area Providers and Advocates.

July 29, 2009. Keynote. Annual Meeting of the National Alliance to End Homelessness. Washington DC

June 9, 2009. Keynote. National Meeting of the VA Supportive Housing Program. Nashville, TN.

February 12, 2009. A Prevention-Centered Approach to Homelessness: A Paradigm Shift? Meeting of the National Alliance to End Homelessness. San Diego, CA.

September 19, 2008. The Dynamics of Homelessness in the United States. The European Observatory's Annual Conference on Homelessness Research. The Haig, Netherlands.

August 12, 2008. A Cost Analysis of Homelessness. The Office of Management and Budget, the City of New York.

May 12, 2008. The Uses of HMIS for Policy Analysis and Systems Reform (Keynote). Annual Meeting of the New England Regional HMIS Consortium.

February 11, 2008. Briefing. Governor Jon Huntsman, State of Utah.

February 7, 2008. A Typology of Family Homelessness. The Bill and Melinda Gates Foundation. Seattle, WA.

January 22, 2008. Briefing. Lieutenant Governor Tim Murray, State of Massachusetts.

November 12, 2007. The Dynamics of Homelessness. University of California at Los Angeles.

October 16, 2007. Invited testimony. United States House of Representatives, Financial Services Committee, Subcommittee on Housing and Community Opportunity. Washington, DC.

October 1, 2007. Homelessness Research and Public Policy. The University of Notre Dame Law School. South Bend, Indiana.

July 12, 2007. Homelessness research and policy in a US context. Tri-Country Conference on Homelessness. Washington, DC: The White House.

May 29, 2007. Briefing on Family Homelessness. United States Senate, HUD Appropriations Committee staff. Washington, DC.

May 22, 2007. Briefing on Family Homelessness. The Domestic Policy Council. The White House, Washington, DC.

March 24, 2007. Briefing on Family Homelessness. The Executive Office of Health and Human Services, Office of the Secretary. The State of Massachusetts.

February 28, 2007. Briefing on the Dynamics of Homelessness. The House of Representatives. The State of Massachusetts.

September 15, 2006. Dynamics of Family Homelessness: Do Family Characteristics Matter? Washington: US Interagency Council on Homelessness.

September 14, 2006. Institutional Discharges and Homelessness: The Impact of Foster Care, Corrections and Inpatient Health on Shelter Admissions. New York: Columbia University, Mailman School of Public Health, Grand Rounds.

April 18, 2006. Housing and Homelessness Research: Applications for Public Policy. The Board of Directors, the MacArthur Foundation.

March 30, 2006. Invited testimony. United States Senate, Subcommittee on Transportation, Treasury, the Judiciary, Housing and Urban Development, and Related Agencies. Washington, DC.

December, 2005. Briefing on the Chronic Homelessness Initiative. The Office of Management and Budget, Office of the Director. The White House. Washington, DC.

May 18, 2005. Space Matters: Measuring the Environment for Health and Behavioral Science Research. Center for Population Health and Health Disparities, 2nd Annual Grantees Meeting. Chicago, Illinois.

May, 2005. Space Matters: Measuring the Environment for Health and Behavioral Science Research. Robert Wood Johnson Foundation, Presidential Lecture. Princeton, New Jersey.

January, 2005. Family Homelessness: Where to From Here? National Alliance To End Homelessness Conference on Family Homelessness, keynote. Los Angeles, CA.

April, 22, 2004. The Dynamics of Homelessness. Columbia University. New York, NY

March, 6, 2004. Homelessness and Public Policy: Where Have We Been and Where Are We Going? Yale University. New Haven, CT.

October 23, 2003. The Dynamics of Homelessness. Boston College. Chestnut Hill, MA.

October 23, 2003. Space Matters: GIS and Social Science. Boston College. Chestnut Hill, MA.

April 20, 2003. The Dynamics of Homelessness. Columbia University. New York, NY.

December 12, 2002. Chronic Homelessness and the Impact of Supportive Housing on Reducing Acute Care Costs. US Department of Veterans Affairs, National Advisory Board on Homelessness. Miami, FL.

July 18, 2002. Chronic Homelessness and the Impact of Supportive Housing on Reducing Acute Care Costs. US Interagency Council on Homelessness. The White House. Washington D.C.

July 18, 2002. Keynote: The Dynamics of Homelessness and the Implications for Public Policy. Annual Conference of the National Alliance to End Homelessness, Washington, DC.

April 15, 2002. Using administrative data to develop web-based decision support tools. Community Statistical Systems Conference, sponsored by the Ford Foundation. Tampa, FL.

April 8, 2002. The dynamics of homelessness and the impact of supportive housing on services use and costs. Federal Policy Academy on Single Adult Homelessness. Boston: Jointly sponsored by the US Dept. of Health and Human Services and the Department of Housing and Urban Development.

February 11, 2002. Research briefing: The Prevalence and Dynamics of Homelessness. The Domestic Policy Council. The White House. Washington, DC.

December, 20, 2001. Research briefing: The Prevalence and Dynamics of Homelessness. US Department of Housing and Urban Development, Deputy Assistant Secretary for Special Needs Programs, Community Planning and Development. Washington, DC.

September 7, 2001. The Costs of Homelessness and the Cost-Offsets Associated with Supportive Housing in New York City. Executive Office of the Governor of New York State, Office of Management and Budget. Albany, NY.

June 26, 2001. The Costs of Homelessness and Benefits of Supportive Housing. Yale University, Department of Psychiatry and the US Department of Veterans' Affairs. New Haven, CT.

June 20, 2001. Invited testimony. US House of Representatives, Committee on Veteran's Affairs, Subcommittee on Health. US Congress. Washington, DC.

March, 2001. The Dynamics of Homelessness. Boston College, Departments of Psychology and Sociology. Chestnut Hill, MA.

January, 2001. The Politics of Homelessness Advocacy and Policymaking. Homelessness Research Conference. Berkeley: University of California at Berkeley.

September, 2000. The Costs of Homelessness and Benefits of Supportive Housing. Bridging the Gaps in Homeless Services. Washington: US DHHS/ASPE.

July 18, 2000. Briefing: The intersection of homelessness and substance abuse. The Office of National Drug Control Policy, Office of the Director, the White House. Washington, DC.

April, 2000. Homeless Research in Support of Policy Analysis. Supported Housing Network of New York. New York, NY.

April, 2000. Homelessness Research to Support Public Policy Analysis. Columbia University, School of Medicine, Department of Psychiatry.

April, 2000. Using Web-based GIS Applications to Support Health and Human Services Planning and Research. Palm Beach County Office of Human Services. Palm Beach, FL.

December, 1999. Homelessness Research to Support Public Policy Analysis. The Fannie Mae Foundation, Meeting of the Board of Directors.

December, 1999. Using Web-based GIS Applications to Support Health and Human Services Planning and Research. US Department of Health and Human Services, Washington, DC.

October, 1999. Briefing: Implications of the dynamics of homelessness for service system planning. Executive Office of the Governor of Massachusetts, Director of Finance and Administration.

July 14, 1999. Collecting Data for the Analysis of Homelessness Policy. National Alliance to End Homelessness. Washington, DC.

April, 1999. Homelessness Research: A Summary. Columbia University, New York, NY.

March, 1999. Making Prevention Work: Data to Support Homelessness Prevention Programs. Massachusetts Housing and Shelter Alliance. Boston, MA.

October 30, 1998. Making Homelessness Programs Accountable to Consumers, Funders and the Public. National Conference on Homelessness Research (HUD/HHS). Washington, DC.

October 29, 1998. Homelessness research briefing. The White House Domestic Policy Council. Washington, DC.

October 22, 1998. Why States Need Standardized Information Collection Systems. Council of State Community Development Agencies, Washington, DC.

October 21, 1998. Recent Research: Findings and Policy Implications. The National Alliance to End Homelessness, Annual Board Meeting, Washington, DC.

May 28, 1998. Keynote: The Policy Research Applications of Homeless Services Information Systems. HUD/Lake County, IL/State of Wisconsin Conference on Homeless Services Information Systems, Chicago, IL.

May 8, 1998. Keynote. Data Collection and Homeless Services Planning Technologies. The National Coalition for Homeless Veterans, Washington, DC.

March 6, 1998. Using GIS for Spatial Decision Support: Creating an Interactive Medium between Community-Based Organizations and Local Government. The Graduate School of the City University of New York.

December 14, 1997. Invited presenter, US Senate Committee on Housing and Financial Affairs, Roundtable on Homelessness, Washington, DC.

November 18, 1997. Keynote. Where the Homeless Come From in Washington, DC: Toward a Homelessness Prevention Approach to Family Homelessness. Fannie Mae Foundation, Homelessness Conference.

November 6, 1997. A Proposal for Homeless Services System Reform. Massachusetts Housing and Shelter Alliance.

August 28, 1997. The Impact of Act 35 on Homelessness in Philadelphia. Testimony before the Pennsylvania House of Representatives Committee for Human Services.

April 1, 1997. The Longitudinal Analysis of Homelessness. Princeton University, Population Studies.

March 5, 1997. Invited testimony. US House of Representatives, Committee on Financial Services, Subcommittee on Housing and Community Opportunity. Washington, DC.

February 25, 1997. The Longitudinal Analysis of Homelessness based on Administrative Records. Rutgers University, Institute for Health, Health Policy and Aging Research.

January 14, 1997. Invited testimony. Pennsylvania Public Utilities Commission. Philadelphia, PA.

January 7, 1997. Confidentiality and Data Sharing Issues for Homeless Services Information Systems. Center for Mental Health Services, US DHHS SAMHSA. Rockville, MD.

December 2, 1996. An Overview of Longitudinal Research on Homelessness in New York City. Columbia University, Department of Psychiatry.

November 19, 1996. Homeless Women in New York City. The Women's City Club of New York. New York City.

November 7-8, 1996. Keynote: Research to Support Homelessness Prevention Programming. Michigan Coalition Against Homelessness, Regional Conferences. Lansing, MI; Detroit, MI.

October 26, 1996. Keynote: Using Shelter Utilization Data to Inform Service System Planning. Massachusetts Housing and Shelter Alliance, Statewide Conference. Boston, MA

October 23, 1996. Keynote: Homelessness Research: Toward a New Policy Agenda. Coalition on Housing and Homelessness in Ohio, Annual Conference. Columbus, OH

June 23, 1996. Information Systems and Research to Support Public Policy. National Alliance to End Homelessness. Washington, DC.

May 18, 1996. The ANCHoR System for Homeless Services. Veteran's Administration Conference on Homelessness. Chicago, IL.

May 12, 1996. Keynote: Toward a Homelessness Prevention Policy. Michigan Coalition to End Homelessness Statewide Conference. Grand Rapids, MI.

April 13, 1996. Homelessness and Public Policy Research. Hunter College. New York, New York.

March 28, 1996. Homelessness and Public Shelter Provision in New York City. New York University, Center for Urban Real Estate and Law Housing Conference. New York, NY.

January 23, 1996. Homeless Services Planning Technologies. Hennepin County and Minneapolis Area Shelter Providers. Minneapolis, MN.

December 14, 1995. Shelter Utilization Patterns of Families in the New York City Shelter System. Emergency Alliance for Homeless Families, New York, NY.

December 11, 1995. An Overview of the ANCHoR System Project. Briefing for the Office of the Assistant Secretary for Community Planning and Development, Office of the Assistant Secretary for Policy Development and Research, US Department of Housing and Urban Development, and the Office of the Assistant Secretary for Planning and Evaluation, US Department of Health and Human Services. Washington, D.C.

September 21, 1995. Applying Integrated Database Research Methods to the Study of Homelessness and Mental Disorders. Columbia University, Department of Psychiatry. New York, NY.

August 23, 1995. The Planning Applications of Management Information Systems for Homeless Services. The Boston Foundation and the Greater Boston Housing and Shelter Alliance. Boston, MA.

June 22, 1995. The ANCHoR System Project: Building a Client and Service Tracking Capacity for Homeless Programs. Annual Conference, National Alliance to End Homelessness. Washington, DC.

June 7, 1995. Applying Shelter Utilization Analysis to Policy and Program Planning. Province of Ontario, Ministry of Housing. Toronto, Ontario.

- May 18, 1995. Shelter Stay Patterns and the Geographic Dispersion of Homelessness in New York City. Briefing of Commissioners and Senior Management from the New York City Department of Housing Preservation and Development, and New York City Department of Homeless Services.
- May 5, 1995. The ANCHoR System Project: Building a Planning and Data Capacity for Homeless Services. Regional Municipality of Ottawa-Carleton, Ministry of Community and Social Services.
- May 4, 1995. Keynote: Toward a Homelessness Prevention Strategy. Canadian National Mental Health Association Conference on Homelessness. Ottawa, Ontario.
- April 11, 1995. Public Policy Research and Homelessness. Hunter College School of Social Work. New York, NY.
- November 17, 1994. Keynote: Building a National Data Capacity for Homelessness Program Planning and Policy Development. Council of State Community Development Agencies, Annual Meeting of State Housing Agency Program Coordinators, Washington, DC.
- November 14, 1994. Homelessness and Social Science Research. Annual Address for Hunger and Homelessness Awareness Week. St. John Fisher College, Rochester, New York.
- October 24, 1994. Building a National Data Capacity for Homelessness Program Planning. Annual PATH State Coordinators Meeting, National Association of State Mental Health Program Directors, Arlington, VA.
- October 17, 1994. Towards a Homelessness Prevention Strategy. The Joint Committee of Housing and Homelessness Advocacy Organizations on the Disposition of *In Rem* Housing in New York City, New York
- September 27, 1994. Establishing Centralized Intake and Client Tracking Systems for Homelessness. US Department of Housing and Urban Development and the US Center for Mental Health Services, *A Call to Action: Preparing for New McKinney Act Programs*, Washington, DC.
- June 14, 1994. Invited testimony. US Senate, Committee on Governmental Affairs, Washington, DC.
- June 10, 1994. Methods for Enumerating Homelessness at the State Level. Council of State Community Development Agencies, Annual Meeting of State Housing Administrators. Washington, DC.
- June 2, 1994. Applying Computerized Tracking Technology to Homelessness Program Planning and Evaluation. The National Conference on Supported Housing for People with Mental Illness. Washington, DC.
- May 21, 1994. The State of Research on Homelessness. Annual Meeting of the National Alliance to End Homelessness. Washington, DC.

- April 26, 1994: Invited testimony. US House of Representatives, Committee on Banking, Subcommittee on Housing and Community Development. Washington, DC.
- September 29, 1993: Estimating the Size and Composition of the Homeless Population Using Administrative Records in Philadelphia and New York City. U.S. Department of Commerce, Bureau of the Census, Washington, D.C.
- April 21, 1993: Applying Shelter Utilization Data to Policy Planning and Analysis: Preliminary Data from Philadelphia and New York City. U.S. Department of Housing and Urban Development, Washington, D.C.
- April 15, 1992: Alternatives to Shelter Reform: Homelessness Prevention and Shelter Diversion. The City of New York, Mayor's Office on Homelessness and SRO Housing, and the Human Resources Administration, New York City, NY.
- April 20, 1989: The Nation's Response to Homelessness: Where to from Here? American Orthopsychiatric Association, Annual Meeting, New York.

Journal Articles:

- Metraux, S, Clegg, L, Daigh, JD & Culhane, DP (in review). Risk factors for becoming homeless among a cohort of veterans who served in the era of the Iraq and Afghanistan conflicts.
- Fargo, JD, Munley, EA, Byrne, TH, Montgomery, AE & Culhane, DP (in review). Factors associated with geographic variation in rates of homelessness among families and single adults.
- Montgomery, AE, Hill, L, Kane V & Culhane DP (in press). Housing First. *Journal of Community Psychology*.
- Culhane, DP, Metraux, S., Byrne, T., Stino, M. & Bainbridge, J. (2013). The age structure of contemporary homelessness: Evidence and implications for public policy. *Analyses of Social Issues and Public Policy*, 13 (1), 1-17.
- Montgomery, AE, Metraux S, & Culhane, DP (2013). Rethinking homelessness prevention among persons with serious mental illness. *Social Issues and Policy Review*, 7 (1), 58-82.
- Culhane, DP, Metraux, S, Byrne, T., Stino, M. & Bainbridge, J. (2013). The aging of contemporary homelessness. *Contexts*.
- Byrne T, Munley EA, Fargo J, Montgomery AE & Culhane, DP (2012). New perspectives on community-level determinants of homelessness. *Journal of Urban Affairs*, 1-19.
- Fantuzzo, J. W., LeBoeuf, W. A., Chen, C., Rouse, H. L., Culhane, D. P. (2012). The unique and combined effects of homelessness and school mobility on the educational outcomes of young children. *Educational Researcher*, 41(9), 393-402.

- Byrne, T, Metraux, S., Moreno, M., Culhane, DP, Toros, H & Stevens, M. (2012). Los Angeles County's Enterprise Linkages Project: An example of the use of integrated data systems in making data-driven policy and program decisions. *California Journal of Politics and Policy*.
- Park, J. M., Metraux, S., Culhane, D. P., & Mandell, D. S. (2011). Homelessness and children's use of mental health services: A population-based study. *Children and Youth Services Review*, 33.
- Metraux, S, Eng N, Bainbridge, J & Culhane, DP (2011). The impact of shelter use and housing placement on mortality hazard for unaccompanied adults and adults in family households entering New York City Shelters: 1990-2002. *Journal of Urban Health*, 88 (6), 1091-1104.
- Culhane, DP, Park, JM & Metraux, S. (2011). The patterns and costs of services use among homeless families. *Journal of Community Psychology*,
- Culhane, DP, Metraux, S & Byrne, T. (2011). A prevention-centered approach to homelessness assistance: A paradigm shift? *Housing Policy Debate*, 21 (2), 295-315.
- Culhane, DP. (2010). Tacking homelessness in Los Angeles' Skid Row: The role of policing strategies and the spatial deconcentration of homelessness. *Criminology and Public Policy*, 9 (4), 851-857.
- Poulin, S., Metraux, S, McGuire, M & Culhane, DP (2010). Services use and costs associated with chronic homelessness: A population-based study in Philadelphia. *Psychiatric Services*, 61 (11), 1093-1098.
- Park, JM, Metraux, S & Culhane, DP (2010). Behavioral health services use among heads of homeless and housed poor families. *Journal of Health Care for the Poor and Underserved*, 21 (2010): 582-590.
- Metraux, S, Byrne, T & Culhane, DP (2010). Institutional discharges and subsequent shelter use among unaccompanied adults in New York. City. *Journal of Community Psychology*, 38 (1), 28-38.
- Branas, CC, Richmond, TS, Culhane, DP, Ten Have, TR & Weibe, DJ (2009). Investigating the link between gun possession and gun assault. *American Journal of Public Health*, 99 (11), 1-7.
- Levitt, A, Bainbridge, J, DeGenova, J, Culhane, DP & Quinn, P (2009). Health and social characteristics of unsheltered adults in Manhattan by chronicity of homelessness. *Psychiatric Services*, 60 (7): 978-981.
- Branas, CC, Elliott, MR, Richmond, TS, Culhane, DP, Ten Have, TR, & Weibe, DJ (2009). Alcohol consumption, alcohol outlets, and the risk of being assaulted with a gun. *Alcoholism: Clinical and Experimental Research*, 11 (4): 906-915.
- Branas, DD, Richmond, TS, Culhane DP & Wiebe, DJ (2008). Novel linkage of individual and geographic data to study firearm violence. *Homicide Studies*, 12 (2008): 298-321.
- Culhane, DP (2008). The costs of homelessness: A perspective from the United States. *The European Journal of Homelessness*, 2 (1), 97-114.

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The Philadelphia Services Utilization Monitoring System: <http://cml.upenn.edu/philareports>.

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- Culhane, D.P., Hadley, T.R., Kiser, L. (1991): Partial hospitalization in the United States: Organizational trends and characteristics, 1969-1988. *The Annual Meeting of the American Public Health Association*, November, 1991, Atlanta, GA.
- Culhane, D.P. (1991): Analyzing patterns of shelter service utilization. *The Annual Meeting of the Pennsylvania Psychological Association*, June 19, 1991, Slippery Rock, PA.
- Culhane, D.P. (1991): Reinstitutionalization: The shelter system and care of the homeless in Philadelphia. *The 11th Annual Meeting of the Eastern Evaluation Research Society*, May 20, 1991, Princeton, NJ.
- Culhane, D.P. (1991): Ending homelessness among women with serious mental illness: A model program from Philadelphia. *The 16th Annual Meeting of the International Association of Psychosocial Rehabilitation Services*, Baltimore, MD.
- Culhane, D.P., Hadley, T.R. & Kiser, L. (1991). Partial hospitalization in the United States: Organizational trends and characteristics, 1969-1988. *The Annual Meeting of the American Association for Partial Hospitalization*, San Antonio, TX.

Consultation and Other Related Experience:

The Barra Foundation (2011- 2012) (consultant)
 The Urban Institute (consultant) (2010 – 2012) (consultant)
 The Paul and Phyllis Fireman Foundation (2010) (consultant)
 City of New York, Department of Homeless Services (1992-1993, 1996-1997, 1999, 2000, 2003-2011)
 (program planning, policy analysis)
 City of Philadelphia, Department of Behavioral Health (2010-2013) (consultant)
 Integrating Factors (2009-2011) Member, Board of Advisors
 County of Los Angeles (2008-2011) (consultant)

Abt Associates (2008-2010) (consultant)
 State of Massachusetts (2006-2010) (consultant)
 Connecticut Coalition to End Homelessness (2008-2010) (consultant)
 Palm Beach County (2009) (consultant)
 University of South Florida (2009) (consultant)
 Mercer County Committee to End Homelessness (2008) (consultant)
 City of San Diego Continuum of Care Planning Committee (2005) (consultant)
 Health Systems Research (2003-2004) (consultant)
 US Interagency Council on Homelessness (2003-2006) (consultant)
 Hudson Planning Group (2003-2006) (consultant)
 Children's Services Council of West Palm Beach, Florida (2001-2003) (consultant)
 Community Research Partners of Columbus, Ohio (2003) (consultant)
 Policy Research Associates (1996-1999) (consultant, homelessness program evaluation)
 The Canadian Mortgage and Housing Corporation (1995) (program planning/MIS development).
 State of Texas, Interagency Council on the Homeless (1994) (program planning).
 Robert Wood Johnson Foundation, Program for Homeless Families (1994) (geographic analyses).
 Temple University/DRC Homeless Persons Substance Abuse Treatment Demonstration Project (1991-1992)
 (ethnographic research consultant).
 City of New York, Human Resources Administration (1992) (planning, policy analysis).
 City of Philadelphia, Office of Services to the Homeless and Adults (1990 – 1991) (research).
 Massachusetts, Department of Mental Health (1989 – 1990) (planning and research for special needs
 populations).
 National Union of the Homeless (1987– 1988) (National Technical Assistance & Leadership Training
 Coordinator).
 Greater Boston Union of the Homeless (1986-1988) (founding organizer; member of the Executive Board)
 Massachusetts Coalition for the Homeless (1985-1987) (research, policy analysis).
 Holy Family Emergency Shelter for Families, East Boston (1985-1986) (volunteer).
 St. Francis Inn, Philadelphia (1982, 1983) (shelter volunteer)

Emily Putnam-Hornstein, PhD, MSW

School of Social Work
University of Southern California
University Park Campus, SWC 218
Los Angeles, CA 90089-0411
[REDACTED] (cell)
ehornste@usc.edu

EDUCATION

2011	PhD	University of California at Berkeley, Berkeley, CA <i>Social Welfare</i>
2005	MSW	Columbia University, New York, NY <i>Social Work</i>
2000	BA	Yale University, New Haven, CT <i>Psychology</i>

FIELDS / AREAS OF RESEARCH

Child Maltreatment; Public Child Welfare Systems; Children and Families; Child Injuries; Child Health Disparities; Administrative Data; Epidemiological Methods

PROFESSIONAL EXPERIENCE

2011 – present	Assistant Professor , School of Social Work University of Southern California <i>Child Development and Children's Services Cluster</i>
2010 – present	Research Associate , Center for Social Services Research University of California at Berkeley <i>California Child Welfare Indicators Project</i>
2005 – 2010	Graduate Student Researcher , Center for Social Services Research University of California at Berkeley <i>California Child Welfare Indicators Project</i>
2004 – 2005	Research Assistant , School of Social Work Columbia University <i>New York Social Indicators Survey Center</i>
2003 – 2004	Social Work Intern , Urban Pathways, Inc.
2001 – 2003	Child Welfare Caseworker , Catholic Guardian Society

- 2000 – 2001 **Research Assistant**, New York State Psychiatric Institute
Columbia University Medical Center
Child & Adolescent Psychiatry
- 1999 – 2000 **Research Assistant**, Psychology Department
Yale University
Agency Development Lab
- 1998 – 1999 **Student Research Intern**
Yale University
The Bush Center in Child Development and Social Policy

AWARDS

- 2014 **Commissioner's Award**, Administration for Children, Youth, and Families
- 2012 **Award for Best Dissertation Research**, Society for Social Work Research (\$1,000)
- 2011 **Award for Top Dissertation**, James & Khadija Midgley Dissertation Award (\$1,000)
- 2011 **Award for Research**, California Professional Society on the Abuse of Children (\$1,000)
- 2011 **Award for Best Social Work Dissertation**, GADE (\$1,000)
- 2009 **Normative Time Student Fellowship**, UC Berkeley (\$8,000)
- 2009 **Mary Ann Mason Child & Family Research Fellowship**, UC Berkeley (\$1,000)
- 2008 **Graduate Student Travel Scholarship**, Center on Race & Social Problems, Summer Session
- 2007 **Graduate Student Travel Scholarship**, IPUMS Data Training

FUNDED RESEARCH

- 3/2014 – 2/2015 **Co- Investigator** (PI, Michael Hurlburt)
Safe and Healthy Neighborhoods Collaborative: Understanding and Preventing
Family Violence and Child Maltreatment
(Total: \$50,000)
- 12/2013 – 3/2014 **Principal Investigator** (Co-PI, Jacquelyn McCroskey)
A Scan of Early Intervention Services and Data in Southern California
First 5 Association
(Total: \$20,000)
- 10/2013 – 9/2014 **Principal Investigator** (Co-PI, Jacquelyn McCroskey)
The Children's Data Network
First 5 LA
(Total: \$999,257)
- 9/2013 – 10/2013 **Principal Investigator**
Risk Factors at Birth and Receipt of Early Intervention Services
Orange County Alliance for Community Health Research

- (Total: \$10,000)
- 2/2013 – 1/2014 **Principal Investigator**
A Birth Cohort Analysis of Medically Attended Infant Maltreatment
 Health Resources and Services Administration (HRSA) Maternal & Child
 Health Branch: R40MC25689
 (Total: \$100,000)
- 2/2013 – 6/2013 **Principal Investigator**
Cumulative Risk of Child Protective Service Involvement: A Population-Based Examination
 First 5 LA
 (Total: \$73,542)
- 5/2013-8/2013 **Consultant** (PI, Rhema Vaithanathan)
Developing a Predictive Risk Model for Child Maltreatment
 New Zealand Ministry of Social Development /University of Auckland
 Department of Economics
 (Consulting Total: \$2,000)
- 7/2012 – 6/2013 **Principal Investigator**
Teen Parenting and Early Childbearing among Current and Former Foster Youth
 Conrad N. Hilton Foundation
 (Total: \$125,000)
- 9/2012-12/2012 **Consultant**
Connecting Risk and Perinatal Service Systems
 SHIELDS for Families
 (Consulting Total: \$9,600)
- 3/2012 – 5/2012 **Co-Principal Investigator** (Co-PI, Dorian Traube)
Substance Abuse Treatment and Child Protective Services Involvement
 USC Behavioral Health Cluster
 (Total: \$8,300)
- 1/2010 – 12/2011 **Principal Investigator** (Dissertation Funding)
An Examination of Injury Mortality among Maltreated Children
 Harry Frank Guggenheim Foundation (Total: \$20,000)
 Fahs-Beck Foundation (Total: \$5,000)
 Center for Child and Youth Policy (Total: \$2,000)

PEER-REVIEWED PUBLICATIONS

* = supervised/mentored graduate student at the time of submission/publication

In Press / Published

1. **Putnam-Hornstein E**, Cederbaum JA, *King B, *Lane A, & Trickett P. (conditional acceptance). A population-based, longitudinal examination of intergenerational maltreatment among teen mothers. *American Journal of Epidemiology*.
2. Wildeman C, Emanuel N, Leventhal J, **Putnam-Hornstein E**, Waldfogel J, & Lee H. (in press). The prevalence of confirmed maltreatment among American children, 2004-2011. *JAMA Pediatrics*.
3. **Putnam-Hornstein E** & *King B. (in press). Cumulative teen birth rates among girls in foster care at age 17: an analysis of linked birth and child protection records from California. *Child Abuse & Neglect*.
4. *King B, **Putnam-Hornstein E**, Cederbaum JA, & Needell B. (in press). A cross-sectional examination of births to girls in foster care. *Children & Youth Services Review*.
5. **Putnam-Hornstein E**, Schneiderman JU, Cleves MA, Magruder J, & Krous HF. (2014). A prospective analysis of sudden unexpected infant death following reported maltreatment. *Journal of Pediatrics*, 164(1), 142-148. [PMID: 24139442]
6. **Putnam-Hornstein E**, Cederbaum JA, *King B, *Cleveland J, & Needell B. (2013). A population-based examination of maltreatment history among adolescent mothers in California. *Journal of Adolescent Health*, 53(6), 794-797. [PMID: 24054914]
7. **Putnam-Hornstein E**, Cleves MA, *Licht R, & Needell B. (2013). Risk of fatal injury in young children following abuse allegations: evidence from a prospective, population-based study. *American Journal of Public Health*, 103(10), e39-e44. [PMID: 23947328]
8. **Putnam-Hornstein E**, Wood JN, Fluke J, *Yoshioka-Maxwell A, & Berger RP. (2013). Preventing severe and fatal maltreatment: making the case for the expanded use and integration of data. *Child Welfare*, 92(2), 59-75.
9. *King B, Lawson J, & **Putnam-Hornstein E**. (2013). Examining the evidence: reporter identity, allegation type, and sociodemographic characteristics as predictors of maltreatment substantiation. *Child Maltreatment*, 18(4), 232-244. [PMID: 24121416]
10. **Putnam-Hornstein E**. (2013). Hierarchical modeling: applications to social work. *Journal of Social Work*, 13(6), 599-615.
11. Vaithianathan R, Maloney T, **Putnam-Hornstein E**, & Jiang N. (2013). Children in the public benefit system at risk of maltreatment: identification via predictive modeling. *American Journal of Preventive Medicine*, 45(3), 354-359. [PMID: 23953364]

12. **Putnam-Hornstein E**, Needell B, *King B, & Johnson-Motoyama M. (2013). Race, poverty, and maternal nativity: an examination of risk and protective factors for involvement with child protective services. *Child Abuse & Neglect*, 37(1), 33-46. [PMID: 23317921]
13. **Putnam-Hornstein E** & *Yoshioka-Maxwell A. (2013). Biogenetic and functional frameworks for the assignment of parentage by the courts: implications for foster caregivers. *Children & Youth Services Review*, 35(6), 930-936.
14. **Putnam-Hornstein E**, Needell B, & Rhodes AE (2013). Understanding risk and protective factors for child maltreatment: the value of integrated, population-based data. *Child Abuse & Neglect*, 37(2-3), 116-119. [PMID: 23260115]
15. Cederbaum JA, **Putnam-Hornstein E**, *King B, *Gilbert K, & Needell B. (2013). Infant birth weight and maltreatment of adolescent mothers. *American Journal of Preventive Medicine*, 45(2), 197-201. [PMID: 23867027]
16. **Putnam-Hornstein E**. (2012). Preventable injury deaths: a population-based proxy of child maltreatment risk. *Public Health Reports*, 127(2), 163-172. [PMID: 22379216]
17. **Putnam-Hornstein E**. (2011). Report of maltreatment as a risk factor for injury death: a prospective birth cohort study. *Child Maltreatment*, 16(3), 163-174. [PMID: 21680641]
18. **Putnam-Hornstein E** & Needell B. (2011). Predictors of child welfare contact between birth and age five: an examination of California's 2002 birth cohort. *Children & Youth Services Review*, 33 (11), 2400-2407.
19. **Putnam-Hornstein E**, Webster D, Needell B, & Magruder J. (2011). A public health approach to child maltreatment surveillance. *Child Abuse Review*, 20, 256-273.
20. **Putnam-Hornstein E** & Shaw TV. (2011). Foster care reunification: an exploration of non-linear hierarchical modeling. *Children & Youth Services Review*, 33(5), 705-714.
21. Shaw TV, **Putnam-Hornstein E**, Magruder J, & Needell B. (2008). Measuring racial disparity in child welfare. *Child Welfare*, 87(2), 23-36. [PMID: 18972930]

Under Review / Under Revision

1. Johnson-Motoyama M, **Putnam-Hornstein E**, Detlaff A, *Zhou K, Finno M, & Needell B (under review). Disparities in infant child protective service involvement by U.S. Hispanic/Latino subgroup and maternal birthplace: a birth cohort study.
2. Lery B, **Putnam-Hornstein E**, Weigmann W, & King B (revise and resubmit). Improving child welfare practice by building analytic capacity and statistical literacy among Title IV-E MSW students.

In Preparation

1. **Putnam-Hornstein E**, Mitchell MN, & Cuccaro-Alamin S. (in preparation). Predicting maltreatment at birth: developing and testing a model from California.

2. **Putnam-Hornstein E**, *Simon J, Magruder J, & *Lane A. (in preparation). Risk of re-reporting among infants who remain at home following a report of maltreatment.
3. Vaithianathan R, **Putnam-Hornstein E**, DeHaan I, & Schwarz D. (in preparation). Predictive risk modeling in child protection: Can it work?
4. **Putnam-Hornstein E**, *King B, Magruder J, *Weigmann W, & Needell B. (in preparation). Paternity establishment among children reported to child protective services: where are all the dads?
5. *Miyamoto S, Romano P, **Putnam-Hornstein E**, Thurston H, Dharmar M, & Joseph J. (in preparation). Serious child maltreatment resulting in hospitalization or death in families previously investigated by child protective services: family and caregiver characteristics.
6. **Putnam-Hornstein E**, Leventhal JM, & *Zhou K. (in preparation). Medically attended infant maltreatment: a prospective birth cohort study

OTHER PUBLICATIONS

1. **Putnam-Hornstein E**, Cederbaum JA, King B, & Needell B (2013). Pregnancy, parenting, and intergenerational maltreatment: a population-based examination of youth involved with child protective services. *Final Report Submitted to the Conrad N. Hilton Foundation*. Available online at: <http://www.hiltonfoundation.org/teenparentsreport>
2. **Putnam-Hornstein E** & Needell B. (2013). Investing in Data Integration: A Strategy for Improving Child Protective Services. *A White Paper Commissioned by the Annie E. Casey Foundation*.
3. **Putnam-Hornstein E**, Webster D, & Needell B. (in press, Spring 2013). Integrating data as a tool for measuring child well-being. *Reaching Out Newsletter, Northern California Training Academy*. Available online at: <http://humanservices.ucdavis.edu/news/pdf/124%20130%20REACHING%20OUT%20FINAL.pdf>
4. **Putnam-Hornstein E**. (2013). Child fatalities: an overview of recent epidemiological data from California. *National Association of Social Workers Press, Child Welfare Specialty Practice Section*.
5. Vaithianathan R, Maloney T, **Putnam-Hornstein E**, Jiang N, DeHaan I, Dale C, & Dare T. (2012). Vulnerable children: can administrative data be used to identify children at risk of adverse outcomes? *The Centre for Applied Research in Economics, Department of Economics, University of Auckland*. Available online at: <http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/vulnerable-children/index.html>
6. **Putnam-Hornstein E**, Needell B, Traube D, Magruder J, Wortell K, Jew-Lochman S, Williams D, & Simon V (2012). Substance abuse treatment and child protective services involvement: An examination of female clients in California. *Submitted to the California Department of Alcohol and Drug Programs and the California Department of Social Services*.

7. Webster D, **Putnam-Hornstein E**, & Needell B. (2011). Data in the context of a state and university collaboration. *CW360°: Child Welfare and Technology*. Available online at: http://www.cehd.umn.edu/ssw/cascw/attributes/PDF/publications/cw360_2011.pdf
8. Needell B & **Putnam-Hornstein E**. (2009). Understanding data and the child welfare system. *California Child Welfare Co-Investment Partnership: Insights, Volume I*. Available online at: http://www.co-invest.org/resources/Insights_0809.pdf
9. Needell B, Webster D, Armijo M, Lee S, Dawson W, Magruder J, Exel M, Cuccaro-Alamin S, **Putnam-Hornstein E**, Williams D, Yee H, Hightower L, Lou C, Peng C, King B, & Henry C. (updated quarterly). *Child Welfare Services Reports for California*: Available online at: http://cssr.berkeley.edu/ucb_childwelfare

PRESENTATIONS

Invited

1. **Putnam-Hornstein E**. (2013, December). Advancing science through data linkage: case studies from California. Invited Presentation, New Zealand Ministry of Social Development: Wellington, NZ.
2. **Putnam-Hornstein E**. (2013, October). Enhancing surveillance to prevent child maltreatment: a few things to think about. Invited Presentation, Casey Family Programs Forum on Public Health Approaches to Improve Safety and Prevent Child Fatalities: Denver, CO.
3. **Putnam-Hornstein E** & Needell B (2013, September). Predictive risk modeling as a tool for targeting early intervention services. Invited Presentation, University of Groningen: Groningen, Netherlands.
4. **Putnam-Hornstein E**. (2013, September). Protecting children: an examination of state and local data. Invited Presentation to the Blue Ribbon Commission on Child Protection: Los Angeles, CA.
5. **Putnam-Hornstein E**. (2013, August). Linking records to advance child protection: recent examples from California. Invited Presentation, Los Angeles County Department of Public Health: Los Angeles, CA.
6. **Putnam-Hornstein E**. (2013, May). Fireside Chat: Integrating Data for Research and Analysis. Invited Panelist, Healthy Communities Data Summit: San Francisco, CA.
7. **Putnam-Hornstein E**. (2013, May). Record linkage as a policy tool: A child welfare case study. Invited Presentation, Children's Policy Brownbag Lunch Series, Alameda County Interagency Children's Policy Council: Oakland, CA.
8. **Putnam-Hornstein E** & Needell B. (2013, April). Linking records to advance child protection: a California case study. Invited Presentation, The State of Health Care Conference: Sacramento, CA.

9. **Putnam-Hornstein E.** (2012, December). Linking child protection and vital records: Lessons for public health and social service agencies. Invited Presentation, San Francisco County Department of Human Services: San Francisco, CA.
10. **Putnam-Hornstein E.** (2012, August). Non-fatal and fatal child maltreatment in California: Examining risk, preventing abuse and neglect. Invited Presentation, End Abuse Long Beach: Long Beach, CA.
11. **Putnam-Hornstein E.** (2012, June). Risk factors for involvement with child protective services: what we have learned from vital birth records. Invited Presentation, Casey Family Programs / CDC / Administration of Children and Families Forum on Public Health Approaches to Improve Safety and Prevent Child Fatalities: Nashville, TN.
12. **Putnam-Hornstein E. & Needell B.** (2012, June). Race, poverty, and nativity: An examination of risk and protective factors for child welfare involvement. Invited Presentation, Research and Training Network, An Evidence-Informed Webinar Series: CA.
13. **Putnam-Hornstein E.** (2012, May). Strengthening the child protections system's ability to protect infants and young children against maltreatment. Invited Presentation, Prevention & Protection Brainstorming Workgroup, Harvard Law School: Cambridge, MA.
14. **Putnam-Hornstein E & Needell B.** (2012, May). A population-based analysis of race/ethnicity, maternal nativity, and socioeconomic status as risk factors for maltreatment. Invited Presentation, Department of Children and Families Los Angeles Policy Workgroup on Disproportionality and Disparity: Los Angeles, CA.
15. **Putnam-Hornstein E.** (2012, March). Risk factors for severe and fatal child injuries. Invited Presentation, Casey Family Programs / CDC / Administration of Children and Families Forum on Public Health Approaches to Improve Safety and Prevent Child Fatalities: Atlanta, GA.
16. **Putnam-Hornstein E.** (2011, November). A public health approach to the prevention of non-fatal and fatal child maltreatment. Invited Presentation, Casey Family Programs / Urban Institute Forum on Child Maltreatment Deaths: Developing Innovative Approaches to Child Protection: Washington, DC.
17. **Putnam-Hornstein E.** (2011, May). A population-level examination of children reported for nonfatal and fatal maltreatment: What are the risks and what can we do? Keynote Address, The Child Abuse Prevention Council's Regional Conference: Fresno, CA.
18. **Putnam-Hornstein E.** (2011, January). Preventable injury deaths as a population-based proxy of child protective service needs. Invited Presentation, Disproportionality, Disparity, Discrimination: Re-Assessing the Facts, Re-Thinking the Policy Options, Harvard Law School: Cambridge, MA.
19. **Putnam-Hornstein E.** (2010, October). A population-based examination of injury mortality among children reported to child protective services in California. Invited Presentation, the California Department of Social Services, Research & Data Analysis Bureau: Sacramento, CA.

20. **Putnam-Hornstein E.** (2010, March). CWS/CMS Dynamic Report System: A technical overview. Invited Presentation, Assembly Human Services Committee, Legislative Aides: Sacramento, CA.
21. **Putnam-Hornstein E.** (2009, September). Racial Disproportionality and Disparity: An overview of data and tools. Invited Presentation, Administrative Office of the Courts: San Francisco, CA.
22. **Putnam-Hornstein E.** (2009, April). Racial disproportionality and disparity in California's Child Welfare System. Invited Presentation, CalSWEC Student Day 2009, Ties that Bind: An Integrative Approach to Child Welfare: Berkeley, CA.
23. **Putnam-Hornstein E.** (2009, April). Federal/State outcome measures: California's performance. Invited Presentation, Foster Care 101 Training, California Senate Office of Research: Sacramento, CA.
24. **Putnam-Hornstein E.** (2008, November). Racial disproportionality in the child welfare system: disproportionate need or systematic bias? Invited Presentation, John Burton Foundation's Child Welfare Policy Briefing: Fresno, CA.
25. **Putnam-Hornstein E.** (2008). Data 101: Numbers, graphs, and more numbers. Multiple half-day trainings provided to managers and staff of the California Children & Family Services Division: Sacramento, CA.
26. **Putnam-Hornstein E.** (2008). Data 201: The empirical data strike back. Multiple half-day trainings provided to managers and staff of the California Children & Family Services Division: Sacramento, CA.
27. **Putnam-Hornstein E.** (2007, May). CFSR2 measures: The good, the bad, and the ugly. Invited Presentation, CalSWEC Regional Meeting: Sacramento, CA.

Peer Reviewed

1. **Putnam-Hornstein E, Schneiderman J, & Magruder J.** (2013, January). A Longitudinal Cohort Analysis of Sudden Infant Death Syndrome Risk and Maltreatment History. Paper presented at the 2013 Annual Conference of the Society for Social Work and Research (SSWR): San Diego, CA.
28. Simon J, **Putnam-Hornstein E**, Magruder J, & Needell B. (2013, January). Re-Referral Rates and Risks: A Prospective Five-Year Study of Infants Remaining in the Home Following an Allegation of Maltreatment. Paper presented at the 2013 Annual Conference of the Society for Social Work and Research (SSWR): San Diego, CA.
29. **Putnam-Hornstein E. & Needell B.** (2012, September). Linking Child Protective Service Records to Population-Based Data: An Introduction from California. International Society for the Prevention of Child Abuse & Neglect: Istanbul, Turkey.
30. Needell B, Jack S, Tonmyr L, Fluke J, & **Putnam-Hornstein E.** (2012, September). Public health implications of child maltreatment data. Working Group on Child Maltreatment Data

Collection, Pre-Congress Meeting. International Society for the Prevention of Child Abuse & Neglect: Istanbul, Turkey.

31. **Putnam-Hornstein E.** (2012, January). A Birth Cohort Study of Maltreatment Type and Subsequent Injury Death. Paper presented at the 2012 Annual Conference of the Society for Social Work and Research (SSWR): Washington, DC.
32. **Putnam-Hornstein E**, Wiegmann W. & Magruder J. (2012, January). Where Are the Dads? The Absence of Established Paternity Among Children Involved with Child Protective Services. Paper presented at the 2012 Annual Conference of the Society for Social Work and Research (SSWR): Washington, DC.
33. King B, **Putnam-Hornstein E**, & Lawson J. (2012, January). Reporter Type as a Predictor of Case Disposition. Paper presented at the 16th Annual Conference of the Society for Social Work and Research (SSWR): Washington, DC.
34. Needell B. & **Putnam-Hornstein E.** (2012, January). A Population-Based Analysis of Race and Poverty as Risk Factors for Maltreatment. Paper presented at the 16th Annual Conference of the Society for Social Work and Research (SSWR): Washington, DC.
35. **Putnam-Hornstein E.** (2012, January). Racial/ethnic disparities in the child welfare system: Recent empirical findings. Paper presented at the 2012 San Diego International Conference on Child and Family Maltreatment, San Diego, CA. (*Panel with John Fluke, Barbara Needell, and Fred Wulczyn.*)
36. **Putnam-Hornstein E.** (2011, December). Risk of Injury Death Following a Report of Physical Abuse: Evidence from a Prospective, Population-Based Study. Paper presented at the 17th Annual Maternal and Child Health Epidemiology Conference: New Orleans, LA.
37. **Putnam-Hornstein E.** (2011, November). A Population-Based Proxy of Child Maltreatment Risk. Paper presented at the Association of Public Policy and Management Conference (APPAM): Washington, DC. (*Symposium with Richard Barth, Brett Drake, and Jeryl Mumpower; Doug Besharov as discussant.*)
38. **Putnam-Hornstein E.** (2011, June). A population-based examination of injury mortality among children reported for maltreatment. Paper presented at One Child, Many Hands: A Multidisciplinary Conference on Child Welfare: Philadelphia, PA.
39. **Putnam-Hornstein E.** & Needell B. (2011, January). Predictors of child welfare contact between birth and age five: An examination of California's 2002 birth cohort. Paper presented at the 15th Annual Society for Social Work Research Conference (SSWR): Tampa, FL.
40. Needell B. & **Putnam-Hornstein E.** (2010, October). Children reported to child welfare before age five. Paper presented at the Champions for Children and Youth 2010 British Columbia Summit: Vancouver, B.C.
41. **Putnam-Hornstein E** (2010, September). An examination of injury mortality among children reported to child protective services: findings from California. Paper presented at the 48th

Annual National Association of Welfare Research and Statistics Conference (NAWRS): Los Angeles, CA.

42. **Putnam-Hornstein, E.** (2010, July). Preventable injury deaths: A population-based proxy of child welfare service needs? Paper presented at the International Family Violence and Child Victimization Research Conference: Portsmouth, NH.
43. **Putnam-Hornstein, E.,** Needell, B., Webster, D. & Williams, D. (2010, July). Linking child welfare records to population based data: Results from California. Paper presented at the 12th National Child Welfare Data Conference, National Resource Center for Child Welfare Data and Technology (NRCCWDT): Washington, DC.
44. Magruder, J., **Putnam-Hornstein, E.,** & Lindley, B., (2009, June). Longitudinal dynamics of youth in foster care. Paper presented at the 12th National Child Welfare Data Conference, National Resource Center for Child Welfare Data and Technology (NRCCWDT): Washington, DC.
45. Magruder, J., **Putnam-Hornstein, E.,** & Needell, B., (2008, August). When permanency remains elusive: A longitudinal examination of the early foster care experiences of youth at risk of emancipating. Paper presented at the 46th Annual National Association of Welfare Research and Statistics Conference (NAWRS): Nashville, TN.
46. Magruder, J., **Putnam-Hornstein, E.,** & Needell, B., (2008, July). Early foster care experiences of youth at risk of emancipating. Paper presented at the 11th National Child Welfare Data Conference (Making IT Work), National Resource Center for Child Welfare Data and Technology (NRCCWDT): Washington, DC.
47. **Putnam-Hornstein, E.** & Shaw, T.V. (2008, January). Foster care reunification: Using hierarchical modeling to account for sibling and county level correlation. Paper presented at the 12th Annual Conference of the Society for Social Work and Research (SSWR): Washington, DC.
48. **Putnam-Hornstein, E.,** Magruder, J. & Shaw, T.V. (2007, October). Measuring, interpreting, and communicating racial disparity in child welfare. Paper presented at the 53rd Annual Program Meeting of the Council on Social Work Education (CSWE): San Francisco, CA.
49. Needell, B., **Putnam-Hornstein, E.,** Shaw, T.V, & Magruder, J. (2007, July). Measuring, interpreting and communicating racial disproportionality and disparity in child welfare. Paper presented at the 10th National Child Welfare Data Conference, National Resource Center for Child Welfare Data and Technology (NRCCWDT): Washington, DC.
50. **Putnam-Hornstein, E.** & Needell, B. (2007, July). Publicly available child welfare data: Use vs. misuse. Paper presented at the 10th National Child Welfare Data Conference, National Resource Center for Child Welfare Data and Technology (NRCCWDT): Washington, DC.
51. Needell, B. & **Putnam-Hornstein, E.** (2006, August). Numbers gone wild: Data use and misuse. Paper presented at the 46th Annual National Association of Welfare Research and Statistics (NAWRS) Conference: Jackson, WY.

TEACHING

2013, Fall	Social Work 619: Social Work Practice in Public Child Welfare Systems University of Southern California, School of Social Work
2013, Spring	Health Promotion & Disease Prevention 490: Directed Research (Daniel Yi) University of Southern California, Department of Preventive Medicine
2012, Fall	Social Work 619: Social Work Practice in Public Child Welfare Systems University of Southern California, School of Social Work
2012, Spring	Social Work 562: Social Work Research University of Southern California, School of Social Work
2012, Spring	Social Work 590: Research Tutorial (Robyn Licht) University of Southern California, School of Social Work
2011, Fall	Social Work 619: Social Work Practice in Public Child Welfare Systems University of Southern California, School of Social Work
2011, Fall	Social Work 790: Directed Research (James Simon) University of Southern California, School of Social Work
2011, Spring	Social Work 282B: Research Methods II University of California at Berkeley, School of Social Welfare
2010, Fall	Social Work 282A: Research Methods I University of California at Berkeley, School of Social Welfare

Curricula

Putnam-Hornstein, E. Needell, B., Lery, B., King, B., & Weigmann, W. (2013). Using publicly available data to engage IV-E students in research and statistics: instructional modules. *University of California at Berkeley, California Social Work Education Center*.

Dissertation and Qualifying Exam Committees

2013	James Simon, LCSW, PhD Candidate <i>Qualifying Exam Committee</i> , School of Social Work, USC
2012-present	Sheridan Miyamoto, RN, PhD Candidate & Doris Duke Child Maltreatment Fellow <i>Qualifying Exam & Dissertation Committees</i> , Betty Davis School of Nursing, University of California at Davis
2012-present	Bryn King, MSW, PhD Candidate <i>Dissertation Committee</i> , School of Social Welfare, University of California at Berkeley

2012 Amy He, MSW, PhD Candidate
Qualifying Exam Committee, School of Social Work, USC

Mentoring Activities

2013-present Andrea Lane, MS, PhD student
School of Social Work, USC
(co-mentor with J. McCroskey)

2013, summer Kechen Zhou, PhD student
Preventive Medicine Biostatistics, USC
(supervision of Hamovitch Summer Research Fellowship)

2012, summer Ting Liu, PhD student
Preventive Medicine Biostatistics, USC
(supervision of Hamovitch Summer Research Fellowship)

2011-present James Simon, MSW, PhD Student
School of Social Work, USC
(co-mentor with J. McCroskey)

SERVICE

Community

2013-present **Advisory Board Member**, Implementation of Essentials for Childhood Safe, Sable, Nurturing Relationships, California Department of Public Health

2013-present **Study Group**, California Health and Human Services Open Data Portal Demonstration Project

2013 **External Grant Reviewer**, Social Sciences and Humanities Research Council of Canada, Insights Grants

2012-present **State Appointed Co-Chair**, Performance Measurement and Outcomes Work Group, California Continuum of Care Reform (Senate Bill 1013):
<http://www.childsworld.ca.gov/PG2976.htm>

2012-present **State Appointed Member**, California Vital Statistics Advisory & Vital Records Protection Committee (Health and Safety Code, Section 102465):
<http://www.cdph.ca.gov/services/boards/Pages/VSAC.aspx>

2012-present **Advisor**, Los Angeles Juvenile Probation Data Project Research Roundtable

2012 **External Grant Reviewer**, Los Angeles Housing Authority: Family Solutions Center

2011-present **Member**, Data Linkage and Information Sharing Committee, California Child Welfare Council

University

2013-2014 **Member**, USC Children & Families Concentration Re-Configuration Work Group

2013-2014 **Member**, Curriculum Council, USC School of Social Work

2013 **Commencement Marshal**, University of Southern California

2011-present **Member**, USC Child Development and Children's Services Cluster

2011-present **Member**, USC Doctoral Committee, School of Social Work

2011-present **Member**, USC Children and Families Concentration

Ad Hoc Manuscript Reviews (2011-2013):

American Journal of Public Health

JAMA Pediatrics

International Journal of Child Abuse & Neglect

Journal of Social Work

Children & Youth Services Review

Child Maltreatment

Cultural Diversity & Ethnic Minority Psychology

OTHER

Media Coverage of Research Findings

Reyes E. (2013). "Teen moms abused as children more likely to become abusers". *The LA Times*: <http://www.latimes.com/local/la-me-childhood-abuse-20131113.0,5673938.story#axzz2kaBZzfVA>

Baeder B. (2013). "Studies: Disproportionate number of black children wind up in L.A. foster care". *The Sun News*: <http://www.sbsun.com/general-news/20130323/studies-disproportionate-number-of-black-children-wind-up-in-la-foster-care>

Harding A. (2013). "Study links maternal abuse history to low birth weight". *Reuters Health*: <http://www.psychcongress.com/article/study-links-maternal-abuse-history-low-birth-weight-12949>

Journal Commentary on Research Findings

Macchione N, Wooten W, Yphantides N, & Howell JR. (2013). Integrated Health and Human Services Information Systems to Enhance Population-Based and Person-Centered Service. *American Journal of Preventive Medicine*, 45(3), 373-374.

Appendix 3—Exceptions to Section G. Contract Terms.

3. Compliance Review:

If the County requires more detailed information regarding SAS' financial soundness, SAS will provide such information directly to the County upon the County's signing SAS' nondisclosure agreement. A copy of the applicable nondisclosure agreement will be provided upon request.

SAS' Solutions OnDemand Group offers pre-sales tours of the data center to potential hosting customers. Customers interested in the tour must sign an NDA specific to the data center tour.

4. Contract Terms and Conditions:

SAS looks forward to putting in place a mutually agreeable contract for the services and software license described in SAS' response to the RFP. Please note SAS' response does not constitute a contract and is contingent on the parties' agreement to separately negotiated, mutually acceptable contract requirements and terms should SAS be selected as the vendor. The contract terms and requirements of the RFP and SAS Solutions onDemand Master Hosting Agreement will serve as the basis for establishing a contract with such additions and changes mutually agreed to by the parties. Neither the RFP, nor SAS' response shall be deemed to constitute an agreement between SAS and the County of Allegheny.

6. Cyber Security:

SAS has implemented logical and physical security policies such as the ones described and others that allow us to host data exactly like those data required for this project. We note that we host HIPAA, FERPA, drug development, government security, and other highly-secure protected data. We can provide additional details on any of our policies at your request, although some of that information is confidential to allow us to maintain our own security and may require an NDA for some discussions.

EXHIBIT C

INSURANCE REQUIREMENTS

For the term of this **AGREEMENT**, the **SERVICE PROVIDER** will take out and maintain or will cause to be taken out and maintained policies of insurance meeting the following requirements:

1. General Requirements

A. ~~All General Liability and Automobile Liability~~ policies of insurance set forth below shall ~~be endorsed to~~ include the **COUNTY**, its elected officials, officers, appointees and employees as additional insureds.

B. ~~All certificates of insurance shall provide that the insurance company notify the~~ Director shall receive, in writing, at least thirty (30) days prior to any termination of the policy or any alterations in the policy which materially change, restrict or reduce the insurance provided or change the name of the insured.

2. Types of Coverages

A. Commercial General Liability

1. Commercial General Liability Insurance which will protect the **SERVICE PROVIDER** in providing the services under this **AGREEMENT** from claims for damage or injury to persons, including wrongful death, and for damage to property which may arise from operations under this **AGREEMENT** whether such operations be by the **SERVICE PROVIDER** or by any subcontractor of the **SERVICE PROVIDER** or by anyone directly or indirectly employed by either the **SERVICE PROVIDER** or subcontractor. The Commercial General Liability Policy will include, but not be limited to, the following:

a. Contractual liability on a blanket basis or contractual liability specifically covering this **AGREEMENT** [NOTE THIS IS ON A BLANKET BASIS. THIS AGREEMENT WILL NOT BE SPECIFICALLY NOTED ON THE POLICY];

b. Products Liability and Completed Operations;

c. The **SERVICE PROVIDER** shall maintain general liability limits of no less than \$1,000,000 per occurrence and aggregate.

B. Automobile Liability Insurance

1. The **SERVICE PROVIDER** shall maintain Comprehensive Automobile Liability Insurance covering all owned and non-owned automobiles if applicable to the services provided under the **AGREEMENT**.

2. The Automobile Liability Insurance shall have a limit of no less than \$1,000,000 combined single limit for each occurrence for injury to persons and/or damage to property.

C. Professional Liability Insurance

The **SERVICE PROVIDER** shall carry Professional Liability insurance policy with limits of no less than \$1,000,000.

D. Workers' Compensation

The **SERVICE PROVIDER** shall carry Workmen's Compensation Insurance as required by law, or shall submit evidence to the **DIRECTOR** that it has qualified with the Pennsylvania Department of Labor and Industry as a self-insurer.

1. Workers Compensation: Statutory
2. Employers Liability with limits:
 - \$100,000 each accident
 - \$500,000 disease policy limit
 - \$100,000 disease each employee.

E. Fidelity Bonding

The **SERVICE PROVIDER** shall ensure that employees who have financial responsibilities related to the receipt and disbursement of funding under this agreement shall be covered by fidelity bond.

The coverage required and to be maintained for fidelity bond insurance shall be minimally:

An amount at least equal to, but not less than 10% of contract total contained in Exhibit B (Payment Provision) of this **AGREEMENT** when program funded/cost reconciled;

An amount equal to, but not less than \$50,000 when the **AGREEMENT** is fee-based/per diem funded;

An amount equal to, but not less than 10% of the program funded amount plus \$50,000 for fee-based services when the contract contains both fee-based/per diem and program funded services.

F. The insurance carrier should have a AM Best rating of no less than A-.

G. The County reserves the right to waive ANY or ALL conditions.

Appendix 4 – Completed RFP Forms

On the following pages, SAS is providing the following completed, and where required, signed form:

- M/W/DBE Participation Form – REQUIRED WITH PROPOSAL SUBMISSION
(attached to p.14 in RFP)
- Proposal Authentication Form (p.16 in RFP)
- Appendix B – abbreviated application (p.17 in RFP)
- Appendix C – W-9 (p.19 in RFP)
- Appendix D – Vendor creation form

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COUNTY OF ALLEGHENY

M/W/DBE PARTICIPATION STATEMENT

Failure to complete this form and submit it with your contract may cause delays in processing

SOLICITATION AND COMMITMENT

MINORITY, WOMEN AND DISADVANTAGED BUSINESS ENTERPRISES

FISCAL YEAR/PERIOD	NAME OF PROVIDER	ADDRESS	PHONE NUMBER
2014/2015	SAS Institute Inc.	100 SAS Campus Dr., Cary, NC 27513	919-677-8000

List below ALL M/W/DBE's that were solicited – whether or not commitment was obtained – Copy this form as necessary

MBE <input checked="" type="checkbox"/> WBE <input checked="" type="checkbox"/> DBE <input type="checkbox"/> CERTIFIED BY: State of PA COMPANY NAME Symphony Enterprises, LLC ADDRESS 400 Mapleview Dr, #1A, Pittsburgh, PA 15520 CONTACT PERSON/PHONE Meenakshi Kapoor EMAIL meenakshi@symphonyenterprises.com	TYPES OF SUBCONTRACT WORK OR MATERIALS IT staffing & consulting services	DATE SOLICITED 04/07/2014 SOLICITATION METHOD Identified M/W/DBE via Pennsylvania Unified Certification Program (PA UCP) and conducted phone interview	COMMITMENT MADE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (IF YES GIVE DATE) MO DAY YR AMOUNT COMMITTED \$0 % OF TOTAL BID N/A	GIVE REASON(S) IF NO COMMITMENT MADE Limited scope of work; No past performance or Bench of Technical Resources with SAS Expertise.
MBE <input checked="" type="checkbox"/> WBE <input type="checkbox"/> DBE <input type="checkbox"/> CERTIFIED BY: State of PA COMPANY NAME Visvero, Inc. d/b/a Datavibes Analytics ADDRESS 2121 Noblestown Rd., Ste 106 Pittsburgh, PA 15205 CONTACT PERSON/PHONE Arvind Handu EMAIL ahandu@visvero.com	TYPES OF SUBCONTRACT WORK OR MATERIALS Specializes in providing technology services, solutions, and custom programming services.	DATE SOLICITED 04/07/2014 SOLICITATION METHOD Identified M/W/DBE via Pennsylvania Unified Certification Program (PA UCP) and conducted phone interview	COMMITMENT MADE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (IF YES GIVE DATE) MO DAY YR AMOUNT COMMITTED \$0 % OF TOTAL BID N/A	GIVE REASON(S) IF NO COMMITMENT MADE Limited scope of work; No past performance or Bench of Technical Resources with SAS Expertise.
MBE <input checked="" type="checkbox"/> WBE <input type="checkbox"/> DBE <input type="checkbox"/> CERTIFIED BY: State of PA COMPANY NAME KORYAK Consulting, Inc. ADDRESS 2003 Kinvara Dr., Pittsburgh, PA 15237 CONTACT PERSON/PHONE Suresh C. Ramanathan EMAIL sramanathan@koryak.com	TYPES OF SUBCONTRACT WORK OR MATERIALS Management consulting, information technology consulting, and software development	DATE SOLICITED 04/07/2014 SOLICITATION METHOD Identified M/W/DBE via Pennsylvania Unified Certification Program (PA UCP) and conducted phone interview	COMMITMENT MADE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (IF YES GIVE DATE) MO DAY YR AMOUNT COMMITTED \$0 % OF TOTAL BID N/A	GIVE REASON(S) IF NO COMMITMENT MADE Declined opportunity--not able to respond in sufficient time.

Prepared By: Annette H. Stevenson, Title: Supplier Diversity Manager Date: 04/18/2014 Signature: 

C.P.M.



SAS
 Victoria Clayton
 Senior Manager
 Contract Operations
 SAS Institute Inc.

**COUNTY OF ALLEGHENY
M/W/DBE PARTICIPATION WAIVER REQUEST**

PROVIDER	SAS Institute Inc.		
ADDRESS	100 SAS Campus Dr., Cary, NC 27513		
CONTACT PERSON	Daniel Shults	OR	Annette H. Stevenson
TELEPHONE NUMBER	919-531-2713		919-531-7241
EMAIL ADDRESS	daniel.shults@sas.com annette.stevenson@sas.com		
FISCAL YEAR/PERIOD	2014/2015		

In all instances a good faith effort must be made to meet the M/W/DBE contract goals as outlined in Section 3.10.8.8 of the "Minority and Women Business Enterprise Utilization Affirmative Action Requirements" document.

If you plan to perform the entire contract without using M/W/DBE subcontractors and/or suppliers or have not completely met the M/W/DBE goal of 13% MBE 2% WBE, the following must be attached and submitted with this form:

- * A detailed explanation of your normal business practice
- * Operation and/or Inventory Profile
- * An active company supplier/subcontractor diversity policy
- * Explanation as to why M/W/DBE participation waiver is being requested

Note: The fully completed M/W/DBE Participation Statement must accompany this waiver request, that shows your "Good Faith Effort"

Prepared By: Annette H. Stevenson, C.P.M. Title: Supplier Diversity Manager Date: 04/16/2014 Signature: 



Victoria Clayton
Senior Manager
Contract Operations
SAS Institute Inc.

Supplier Diversity at SAS

4/17/2014

A. Supplier Diversity Statement

SAS has an active and award winning supplier diversity program. Our customers represent a wide range of industries, people and locations — and we want this same level of diversity reflected in our supplier community. Our goal is to develop and maintain effective relationships with suppliers that create incremental value throughout the life of each contract based upon economy, quality, environmental preservation, and social values:

Because SAS is not a typical manufacturing environment, the creation of our product does not require purchasing materials or component parts, but rather relies on a highly skilled staff of technical professionals. SAS complies with the federal laws and regulations which prohibit discrimination in employment based on race, color, religion, gender, national origin, age, disability, or veteran status.

In the area of professional services offered to our customers and in the procurement of goods and services to support corporate operations, SAS is committed to continuously seek ways to make business opportunities available to small businesses as well as businesses in certain social economic categories such as minority and woman business enterprises, HUBZone, and Service Disabled veteran-owned businesses. SAS provides these businesses the maximum practicable opportunity to participate in the contracts and subcontracts it awards to the fullest extent consistent with the efficient performance of the contract. To that end, SAS is a member of the **National Minority Supplier Development Council (NMSDC)** and the **Women's Business Center of North Carolina**.

B. Program and Business Practice

SAS has two full time personnel (manager and administrative assistant) dedicated to our supplier diversity program. As part of the Corporate Services Division, they are responsible for advancing the goals and objectives **of the company's supplier diversity initiatives. In support of this, our Supplier Diversity manager presently serves in the following positions:**

Board member of the Carolinas-Virginia Minority Supplier Development Council

Board member for the N.C. M/WBE Coordinators' Network

Board member of the N.C. Veterans Business Association

Member of the State of North Carolina's Diversity Advocacy Partnership Council

Board member of the Triangle Chapter, Institute of Supply Management Carolinas-Virginia Region

SAS' supplier diversity program has been credited with several accolades and service awards. Notable recognition includes: Small Business Administration's 2012 North Carolina Veterans Business Champion of the Year, Small Business Administration's 2011 North Carolina Minority Small Business Champion of the Year for both North Carolina and SBA's Southeast Region IV, Advocate of the Year by the Carolinas Minority Supplier Development Council, and Woman Business Advocate of the Year by the Women's Business Center of North Carolina.

At SAS we work to continually identify efforts to provide MWBEs access to procurement opportunities either by making purchases directly or through our 2nd Tier efforts. Recent highlights include:

1. Set and exceeded our 5% MWBE goals on two major construction projects.
2. Required a prime contractor/MSP (Managed Service Provider) to have separate MWBE participation goals. Expedited the MWBE payment process by requiring approved payments for services go directly to the participating MWBE and not through the MSP. This policy enabled our diverse suppliers to better meet cash-flow demands.

SAS also seeks alternative ways to support our supplier diversity initiatives, specifically:

3. Provided access to SAS resources by hosting educational events on campus (i.e. certification and business development workshops) and by providing sponsorships for MWBEs to attend local/state/national events/conference.
4. Increased participation of MWBE companies in the formal SAS Alliance Program. The Alliance Program gives partners access to: SAS software, training for growth and development and partnering activities to generate revenue. Information on the SAS Alliance Program and Partner Directory can be viewed here: <http://www.sas.com/partners/directory/index.html>

Any questions related to SAS' Supplier Diversity initiatives should be directed via email to the Supplier Diversity Manager at supplierdiversity@sas.com or Annette.Stevenson@sas.com

Annette Hibbert Stevenson, C.P.M. Manager, Supplier Diversity
Strategic Sourcing and Procurement - Corporate Services Division
Telephone: 919-531-7241
SAS Institute Inc. - SAS Campus Drive (T6108) - Cary N.C. 27513

SAS' Supplier Diversity Program supports and is engaged in numerous minority and women trade organizations, such as US PAN Asian American Chamber of Commerce, United Minority Contractors Association, Hispanic Contractors Association and the NC Indian Economic Development Initiative. SAS is also an active corporate member of NMSDC (National Minority Supplier Development Council) which is the largest non-profit organization involved in minority supplier development. Members of NMSDC represent more than 460 of America's largest publicly-owned, privately-owned and foreign-owned companies, and their purchasing activity is national and international in scope.

SAS frequently utilizes NMSDC and their regional affiliates to assist in identifying potential diverse subcontractors. Additionally, as part of our due diligence, we conduct Supplier outreach by participating in federal, state and corporate-organized diversity supplier outreach.

SAS, a global company and leader in business analytics, is the largest independent vendor in the business intelligence market. SAS has proprietary software and niche business solutions. Subcontracting opportunities for our Professional Services requires highly skilled technical consultants. These unique consultants are difficult to source and cannot be routinely provided by generic IT staffing firms.

As a Corporation conducting business globally, as well as in all 50 states in America, SAS has an intricate process to identify, vet, and on-board subcontractors. SAS works to ensure our supplier relationships are mutually beneficial and that all technical and business requirements are in place prior to executing any opportunities. During our efforts to conduct good faith outreach, SAS strives to NOT give false hopes, but rather meaningful supplier outreach that provides access to current procurement/subcontracting opportunities.

Given our detailed process, SAS proactively and continually develops an ecosystem of M/W/DBE diverse suppliers (SAS Partners) to include in subcontracting opportunities. SAS works with a broad community of suppliers that spans geographies, industries, and specialties. We are diligent in our good faith efforts to increase M/W/DBE participation in its contracts.

We have been successful in our goal of increased HUB participation by contracting directly or indirectly with M/W/DBEs. Specifically, SAS has achieved an increase of M/W/DBE diversity spend in the area of subcontracting Professional Services in each of the past three years.

C. M/W/DBE Participation Waiver Request

SAS is requesting a waiver for the M/W/DBE participation for the RFP "To Design and Implement Decision Support Tools and Predictive Analytics in Human Services." We identified the following three M/W/DBEs and contacted them telephonically to discuss potential subcontracting opportunities:

1. Symphony Enterprises, LLC
2. Visvero, Inc.
3. Koryak Consulting, Inc.

The suppliers were interviewed and none were selected to participate as identified on our form: M/W/DBE Participation Statement, Solicitation and Commitment. If there are future opportunities to subcontract, as identified by the County of Allegheny and/or SAS, we would be diligent in our good faith efforts to identify ways to include M/W/DBEs in commercially useful work.

Note: For this RFP, SAS is partnering with a company called Public Policy Analytics, LLC. This company meets the SBA (U.S. Small Business Administration) criteria of a small business. They are identified in the Dunn & Bradstreet data base as a small business. And, while this company is not officially certified as a M/W/DBE, the co-owner (50%) of the company is an ethnic minority (Hispanic/Latino). The co-owner's name is Dr. Manuel Moreno.

In summary, SAS mirrors the value and goal as the State the Pennsylvania and County of Allegheny in its commitment to promoting full and equal business opportunities for M/W/DBEs. We have a strong supplier diversity program, as reflected in the above information, and we are requesting a waiver for M/W/DBE participation on this specific RFP.

APPENDIX A
PROPOSAL AUTHENTICATION FORM

TITLE: Decision Support Tools and Predictive Analytics in Human Services

DUE DATE: APRIL 18, 2014

The undersigned hereby offers to furnish and deliver the services as specified in strict accordance with the RFP and scope of proposal, all of which are made a part of this request. This offer is not subject to withdrawal without permission of the County of Allegheny Department of Human Services Director.	
FULL LEGAL COMPANY NAME:	SAS Institute Inc.
DOING BUSINESS AS:	SAS
STREET ADDRESS:	100 SAS Campus Drive
CITY, STATE AND ZIP CODE:	Cary, NC 27513-2414
AUTHORIZED SIGNATURE:	
PRINT NAME:	 Victoria Clayton Senior Manager Contract Operations SAS Institute Inc.
TITLE OF AUTHORIZED SIGNER:	
TELEPHONE #:	919-677-8000
FAX #:	919-677-4444
WEBSITE URL:	www.sas.com
E-MAIL ADDRESS:	

Chapter 2
COMPANY INFORMATION

(This information is for tracking purposes only and has no role in the determination of the responsible proposer.)

- ☐ Check here if your firm is registered with the Allegheny County Department of Minority, Women and Disadvantaged Business Enterprises

- ☐ Check here if your firm is a "Minority Business Enterprise" or "MBE" as defined in the Small Business Act, 15 USC

- ☐ Check here if your firm is a "Women Business Enterprise" or "WBE" as defined in the Small Business Act, 15 USC

- ☐ Check here if your firm is a "Small Business" as defined by the Small Business Administration (13 C.F.R. 121.201, in most cases, this means a business with 500 or fewer employees)

NOTE: THIS PAGE MUST BE SUBMITTED WITH YOUR PROPOSAL. ALL PAGES REQUIRES A LIVE SIGNATURE SIGNED IN BLUE INK.



APPENDIX B
ABBREVIATED APPLICATION

1. Primary Contacts

	Chief Executive	Chief Information Officer	Chief Financial Officer	Contract Processing Contact
Name	James Goodnight	Keith Collins	Donald Parker	Victoria Clayton
Email				
Phone	919-677-8000	919-677-8000	919-677-8000	919-677-8000

Note: If you are an individual applying, you may identify yourself for all of the above roles.

2. I/we certify that this I/we/this organization is not currently under suspension or debarment by the Commonwealth of Pennsylvania, any other state, county or the federal government.

☒ So certified

3. Have you ever obtained or been denied a performance or fidelity bond, or has your bond ever been revoked?

☐ Yes ☒ No

If yes, explain:

4. Has an application to be an Allegheny County provider/vendor been denied in the past?

☐ Yes ☒ No

If yes, explain:

5. Have you ever filed for bankruptcy?

☐ Yes ☒ No

If yes, explain:

6. Have your paid all taxes for the past years, including but not limited to real estate tax, employer taxes, employee withheld taxes, personal income tax (if individual)?

☒ Yes ☐ No

If yes, explain: To the best of our knowledge and belief, SAS is not delinquent in any of its local, state, national, or international tax obligations.

7. Do you have the capability to do electronic billing if required?

☒ Yes ☐ No

If yes, explain: ePoint is a purchase order interface tool developed by SAS to receive purchase orders from our customers via Electronic Data Interchange (EDI), and to send invoices (regular and credit) to our customers via EDI.

8. Do you currently carry the insurance (see contract on DHS website) required to enter into a contract with DHS?

☒ Yes ☐ No

If yes, explain: See attached for insurance.

9. Do you/your staff have valid Pennsylvania driver licenses?

☐ Yes ☐ No

If yes, explain: N/A, per vendor Q&A (4/15/14)

As an authorized signatory for SAS Institute Inc. I hereby certify to the best of my knowledge and belief that the information in this proposal and application is true and accurate.

Signature:  Date: APR 17 2014

Print/Type Name: _____
Victoria Clayton
Senior Manager
Contract Operations
SAS Institute Inc.



Request for Taxpayer Identification Number and Certification

Give Form to the
requester. Do not
send to the IRS.

Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return) SAS Institute Inc.	
	Business name/disregarded entity name, if different from above	
	Check appropriate box for federal tax classification: <input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C Corporation <input checked="" type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <input type="checkbox"/> Other (see instructions) ▶ _____	Exemptions (see instructions): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____
	Address (number, street, and apt. or suite no.) SAS Campus Drive City, state, and ZIP code Cary, NC 27513	Requester's name and address (optional)
	List account number(s) here (optional)	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number										
				-			-			
Employer identification number										
[REDACTED]										

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below), and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here	Signature of U.S. person ▶ <i>Mm Duul De</i>	Date ▶ <i>1/2/2014</i>
-----------	--	------------------------

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. The IRS has created a page on IRS.gov for information about Form W-9, at www.irs.gov/w9. Information about any future developments affecting Form W-9 (such as legislation enacted after we release it) will be posted on that page.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, payments made to you in settlement of payment card and third party network transactions, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the

withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

APPENDIX D

Allegheny County

Vendor Creation Form

Controller's use only:

Supplier No. _____

1099 Eligibility: ☐ Yes ☐ No

☐ Add ☐ Change Supplier No. _____

57-1133017

Company Information:

Federal Tax ID (TIN)

SAS Institute Inc.

Company Name (Please type or print)

Original W-9 must be attached

Required information Type of Service Provided

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> Independent Contractor | <input type="checkbox"/> Rent |
| <input type="checkbox"/> Maintenance/Service Agreement | <input type="checkbox"/> Care Giver |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Legal |
| <input type="checkbox"/> Personal Reimbursement | <input type="checkbox"/> Medical |
| <input checked="" type="checkbox"/> Other (please list) | |

Type of Commodity Provided

(please describe below)

Software and related services

Required Information

Minority Or Women Owned

☐ Yes ☒ No

If yes select ethnicity and gender of the vendor below:

- | | |
|--------------------------|-----------------------------|
| <input type="checkbox"/> | Asian Pacific American |
| <input type="checkbox"/> | Black American |
| <input type="checkbox"/> | Hispanic American |
| <input type="checkbox"/> | Native American |
| <input type="checkbox"/> | Subcontinent Asian American |
| <input type="checkbox"/> | Non-Minority Woman |
| <input type="checkbox"/> | Other |

If Yes ☐ Male ☐ Female

Certified By: ☐ PAUCP ☐ PADGS ☐ Non PA Certification

(attach copy of certification)

Non-Profits including Faith Based Organizations

- ☐ Faith Based Non-Minority
- ☐ Faith Based Minority
- ☐ African American Non-Profit
- ☐ Other Non-Profit

Outreach Manager Interface ☐ Yes ☒ No

APPENDIX D

Industry Classification by NAICS Code

Primary Industry 511210

Secondary Industry (if applicable) _____

*If code is not known go to <http://www.census.gov/epcd/naics02/naicod02.htm> and select the correct code.

~~Supplier Information (Search Type "P") – (Where PO should be sent to place order)~~

~~Please type or print~~

~~Company Name~~

~~Telephone Number~~

~~Address Line 1~~

~~Fax Number~~

~~Address Line 2~~

~~Address Line 3~~

~~City~~

~~State~~

~~ZIP Code~~

Required Information

Supplier/Remit To Information (Search Type "V") – (Where check will be mailed for payment. Check must be made payable to exact name listed under TIN provided or check cannot be processed.)

Please print or type

Supplier/Payee Name

SAS Institute Inc.

Address Line 1

P.O. Box 406922

Address Line 2

Address Line 3

City

Atlanta

State

GA

ZIP Code

30384-6922

Telephone Number

919-677-8000

Fax Number

919-677-4444

*If the "remit to" information provided on form does not match invoices submitted for payment, the Controller's Office MUST contact supplier to verify address information before payments are processed. Thank you for your cooperation.

APPENDIX D

If the Allegheny County Department with which you do business is known, providing the information below will help in the processing of your payments. **Failure to include the information may result in processing delays.**

Allegheny County Departmental Contact

Name	Leslie Lewis-Pollard
Telephone No.	412-350-5663
Fax No.	412-350-3414
EMail Address:	Lewis-pollard@alleghenycounty.us

Supplier/Payee Contact Name

Name	SAS AR
Telephone No.	919-531-5401
Fax No.	919-531-9438
Email Address:	saspay@sas.com
